

POTENTIAL OF VEGETABLE OIL DEGRADING BACTERIA AS INOCULUM FOR BIOAUGMENTATION IN THE REMEDIATION OF CONTAMINATED SITES

Celene Sánchez Holmedilla^a, Fausto Silva^a, Gabriela Piperata^b, Debora Conde Molina^a

^a*Grupo de Biotecnología y Nanotecnología Aplicada, Facultad Regional Delta, Universidad Tecnológica Nacional, Campana, ARGENTINA*

^b*Termoeléctrica Manuel Belgrano S.A., Campana, ARGENTINA*

e-mail: dconde@frd.utn.edu.ar

REVIEW

The environment is negatively impacted by occasional discharges from industrial activity. When these discharges contain insoluble compounds such as fats, oils and grease, they are high impact pollutants. This work focuses on an environmental problem in the industrial area of Campana, Buenos Aires, where a vegetable oil residues treatment industry generated a significant uncontrolled discharge of waste into Lagoon 3 of the private nature reserve El Morejón. In view of this, there is a need to address bioremediation strategies to clean up the area. The aim of this work is to study growth conditions of vegetable oil degrading bacterial consortia, previously isolated from lagoon 3, with a view to applying it as an inoculum in bioaugmentation strategy. For this purpose, bacteria were tested in flask containing liquid culture media at different conditions, such as: medium formulated with 2-5 % v/v vegetable oil -as only carbon source-, shaking at 135-220 rpm, medium formulated with alternative carbon source of sweet potato waste (5% w/v). The best condition for the growth of bacteria was a culture medium formulated with 5 % v/v vegetable oil, incubated at 135 rpm for days, reaching 9 g/L of biomass. Moreover, this condition maintains the selection pressure so that bacteria preserve the ability to degrade vegetable oils. The significant biomass obtained positions these autochthonous bacteria with great potential to be applied as bioaugmentation in site-specific bioremediation strategy for the remediation of Lagoon 3.

Key words: Vegetable oil degrading bacteria, Biomass, Agro-industrial wastes as substrates, Bioaugmentation, Bioremediation.