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Production and characterization of rhamnolipid using palm oil agricultural refinery waste

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Abstract

In this research we assess the feasibility of using palm oil agricultural refinery waste as a carbon source for the production of rhamnolipid biosurfactant through fermentation. The production and characterization of rhamnolipid produced by *Pseudomonas aeruginosa* PAO1 grown on Palm Fatty Acid Distillate (PFAD) under batch fermentation were investigated. Results show that *P. aeruginosa* PAO1 can grow and produce 0.43 g L⁻¹ of rhamnolipid using PFAD as the sole carbon source. Identification of the biosurfactant product using mass spectrometry confirmed the presence of monorhamnolipid and dirhamnolipid. The rhamnolipid produced from PFAD were able to reduce surface tension to 29 mN m⁻¹ with a critical micelle concentration (CMC) 420 mg L⁻¹ and emulsify kerosene and sunflower oil, with an emulsion index up to 30%. Results demonstrate that PFAD could be used as a low-

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