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Optimum medium components for biosurfactant production by klebsiella pneumoniae WMF02 utilizing sludge palm oil as a substrate

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Abstract

In the present study, optimizing critical nutritional constituents was attempted as a primary strategy to improve biosurfactant production from Klebsiella pneumoniae WMF02 in liquid state fermentation utilizing sludge palm oil as a substrate . One-factor-at-a-time (OFAT) optimization was employed to evaluate the effects of sludge palm oil (SPO), sucrose, $MgSO_4$, $FeSO_4$, $NaNO_3$ and K_2HPO_4 on surface tension reductivity. Sucrose was selected as a co-substrate over glucose in the production media. The optimal levels of the aforementioned variables were (g/l) sucrose 5.0, $MgSO_4$ 0.4, $FeSO_4$ 0.3, $NaNO_3$ 2.0, and K_2HPO_4 4.0, with SPO concentration of 4% (v/v). The optimized medium shows surface tension reduction from 36.2 mN/m (non-optimized medium) to 25.70 mN/m.

Preliminary biosurfactant identification indicated that the biosurfactant produced was phospholipids in nature.

Author keywords

Biosurfactant ; Klebsiella pneumoniae ; One-factor-at-a-time optimization (OFAT); Sludge palm oil

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