Solid State Biosurfactant Production in a Fixed-Bed Column Bioreactor

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Biosurfactants are surface active substances which reduce interfacial tension and are produced or excreted at the microbial cell surface. We evaluated the biosurfactant production by *Aspergillus fumigatus* and *Phialemonium* sp. in solid state processes using fixed-bed column reactors. We evaluated two media, rice husks alone (simple support) and rice husks plus defatted rice bran (complex support), both enriched with either soy oil or diesel oil. The highest water-in-oil emulsifying activity ($EA_{w/o}$) obtained was 7.36 EU g^{-1} produced by *A. fumigatus* growing on complex support enriched with soy oil and supplied with air at a rate of 60 mL g^{-1} h^{-1}, while *Phialemonium* sp. had a maximum production of 6.11 EU g^{-1} using the simple support with diesel oil and an aeration rate of 120 mL g^{-1} h^{-1}. The highest oil-in-water emulsifying activity ($EA_{o/w}$) was 12.21 EU g^{-1} produced by *Phialemonium* sp. on the complex support enriched with diesel oil and at an aeration rate of 60 mL g^{-1} h^{-1}, while *A. fumigatus* produced a maximum $EA_{o/w}$ of 10.98 EU g^{-1} when growing on the complex support with no additional carbon source and an aeration rate of 60 mL g^{-1} h^{-1}.

Key words: Biosurfactant, Emulsifying Activity, Fixed-Bed Bioreactors, Solid State Processes