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POTENTIAL OF *BREVIBACILLUS* SP. AVN 13 ISOLATED FROM CRUDE OIL CONTAMINATED SOIL FOR BIOSURFACTANT PRODUCTION AND ITS OPTIMIZATION STUDIES

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Abstract

In this study, a hydrocarbon degrading organism *Brevibacillus* sp. AVN 13 was isolated and utilized for biosurfactant production. A total of twenty four isolates were obtained from crude oil spilled soil and screened for biosurfactant production using different methods such as blood agar test, cetyl trimethylammonium bromide methylene blue agar test, hydrocarbon overlay agar test, emulsification test and surface tension. Among the different biosurfactant producers, the isolate AVN13 was noted as high yielding strain which reduced the surface tension up to 36mN/m with 72% emulsification activity. By 16S rRNA analysis, the high yielding isolate was identified as *Brevibacillus* sp. AVN13. The effect of pH, temperature, carbon source and nitrogen source on biosurfactant production by *Brevibacillus* sp. AVN13 was investigated. It was observed that the optimum pH and temperature for biosurfactant production were 7 and 40°C respectively. Similarly, used engine oil and potassium nitrate were found to be the preferred carbon and nitrogen sources at a concentration of 1% v/v and 0.5% w/v respectively. The kinetics of biosurfactant production was studied which clearly indicated that the biosurfactant production was associated with biomass growth. Furthermore, the produced biosurfactant was undergone stability analysis of pH and temperature and reported. The antimicrobial properties of biosurfactant produced were also analyzed. The biosurfactant produced was characterized using FTIR (Fourier transform infrared spectroscopy) and found to be lipopeptide type of biosurfactant. These results suggested that *Brevibacillus* sp. AVN 13 could be effectively employed for biosurfactant production.

Keywords: Biosurfactant, Emulsification, Surface tension, *Brevibacillus* sp.

1. Introduction