

Characterization of a diesel-degrading strain isolated from a hydrocarbon-contaminated site

Abstract

A diesel-degrading bacterium has been isolated from a diesel-polluted site. The isolate was tentatively identified as *Staphylococcus aureus* strain DRY11 based on partial 16S rDNA molecular phylogeny and Biolog® GP microplate panels and Microlog® database. Isolate 11 showed an almost linear increase in cellular growth with respect to diesel concentrations with optimum growth occurring at 4% (v/v) diesel concentration. Optimization studies using different nitrogen sources showed that the best nitrogen source was potassium nitrite. Sodium nitrite was optimum at 1.2 g l⁻¹ and higher concentrations were strongly inhibitory to cellular growth. The optimal pH that supported growth of the bacterium was between 7.5 to 8.0 and the isolate exhibited optimal broad temperature supporting growth on diesel from 27 to 37°C. An almost complete removal of diesel components was seen from the reduction in hydrocarbon peaks observed using Solid Phase Microextraction Gas Chromatography analysis after 5 days of incubation. The characteristics of this bacterium suggest that it is suitable for bioremediation of diesel spills and pollutions in the tropics.

Keywords

Characterization; Diesel-degrading; Isolation; *S. aureus*