

## Characterization of a sodium dodecyl sulphate-degrading *Pseudomonas* sp. strain DRY15 from Antarctic soil

### ABSTRACT

A bacterium capable of biodegrading surfactant sodium dodecyl sulphate (SDS) was isolated from Antarctic soil. The isolate was tentatively identified as *Pseudomonas* sp. strain DRY15 based on carbon utilization profiles using Biolog GN plates and partial 16S rDNA molecular phylogeny. Growth characteristic studies showed that the bacterium grew optimally at 10 degrees C, 7.25 pH, 1 g l<sup>-1</sup> SDS as a sole carbon source and 2 g l<sup>-1</sup> ammonium sulphate as nitrogen source. Growth was completely inhibited at 5 g l<sup>-1</sup> SDS. At a tolerable initial concentration of 2 g l<sup>-1</sup>, approximately 90% of SDS was degraded after an incubation period of eight days. The best growth kinetic model to fit experimental data was the Haldane model of substrate inhibition with a correlation coefficient value of 0.97. The maximum growth rate was 0.372 hr<sup>-1</sup> while the saturation constant or half velocity constant (K<sub>s</sub>) and inhibition constant (K<sub>i</sub>), were 0.094% and 11.212 % SDS, respectively. Other detergent tested as carbon sources at 1 g l<sup>-1</sup> was Tergitol NP9, Tergitol 15S9, Witconol 2301 (methyl oleate), sodium dodecylbenzene sulfonate (SDBS), benzethonium chloride, and benzalkonium chloride showed Tergitol NP9, Tergitol 15S9, Witconol 2301 and the anionic SDBS supported growth with the highest growth exhibited by SDBS.

**Keyword:** Antarctica; Biodegradation; *Pseudomonas* sp.; SDS