

Isolation and characterization of an SDS-degrading *Klebsiella oxytoca*.

ABSTRACT

Sodium dodecyl sulfate (SDS) is one of the main components in the detergent and cosmetic industries. Its bioremediation by suitable microorganism has begun to receive greater attention as the amount of SDS usage increases to a point where treatment plants would not be able to cope with the increasing amount of SDS in wastewater. The purpose of this work was to isolate local SDS-degrading bacteria. Screening was carried out by the conventional enrichment-culture technique. Six SDS-degrading bacteria were isolated. Of these isolates, isolate S14 showed the highest degradation of SDS with 90% degradation after three days of incubation. Isolate S14 was tentatively identified as *Klebsiella oxytoca* strain DRY14 based on carbon utilization profiles using Biolog GN plates and partial 16S rDNA molecular phylogeny. SDS degradation by the bacterium was optimum at 37 degrees C. Ammonium sulphate; at 2.0 g l⁻¹, was found to be the best nitrogen source for the growth of strain DRY14. Maximum growth on SDS was observed at pH 7.25. The strain exhibited optimum growth at SDS concentration of 2.0 g l⁻¹ and was completely inhibited at 10 g l⁻¹ SDS. At the tolerable initial concentration of 2.0 g l⁻¹, almost 80% of 2.0 g l⁻¹ SDS was degraded after 4 days of incubation concomitant with increase in cellular growth. The K_m(app) and V_{max}(app) values calculated for the alkylsulfatase from this bacterium were 0.1 mM SDS and 1.07 micromol min⁻¹ mg⁻¹ protein, respectively.

Keyword: Sodium dodecyl sulfate; Biodegradation; *Klebsiella oxytoca*.