

Isolation and characterization of an acrylamide-degrading *Bacillus cereus*

ABSTRACT

Several local acrylamide-degrading bacteria have been isolated. One of the isolate that exhibited the highest growth on acrylamide as a nitrogen source was then further characterized. The isolate was tentatively identified as *Bacillus cereus* strain DRY135 based on carbon utilization profiles using Biolog GP plates and partial 16S rDNA molecular phylogeny. The isolate grew optimally in between the temperatures of 25 and 30°C and within the pH range of 6.8 to 7.0. Glucose, fructose, lactose, maltose, mannitol, citric acid and sucrose supported growth with glucose being the best carbon source. Different concentrations of acrylamide ranging from 100 to 4000 mg l⁻¹ incorporated into the growth media shows that the highest growth was obtained at acrylamide concentrations of between 500 to 1500 mg l⁻¹. At 1000 mg l⁻¹ of acrylamide, degradation was 90% completed after ten days of incubation with concomitant cell growth. The metabolite acrylic acid was detected in the media during degradation. Other amides such as methacrylamide, nicotinamide, acetamide, propionamide and urea supported growth with the highest growth supported by acetamide, propionamide and urea. Strain DRY135, however, was not able to assimilate 2-chloroacetamide. The characteristics of this isolate suggest that it would be useful in the bioremediation of acrylamide.

Keyword: Isolation; Characterization; Acrylamide-degrading; *Bacillus cereus*