

# Starch hydrolysing *Bacillus halodurans* isolates from a Kenyan soda lake.

## Abstract:

Fourteen obligate alkaliphilic and halotolerant bacterial isolates, exhibiting extracellular amylase activity at 55 degrees C and pH 10, were isolated from hot springs around Lake Bogoria, Kenya. From 16S rDNA sequence analysis, nine isolates shared 100% identity with *Bacillus halodurans* strain DSM 497T, while the rest shared 99% identity with alkaliphilic *Bacillus* species A-59. PCR of the intergenic spacer region between 16S and 23S rRNA genes (ISR-PCR) divided the isolates into two groups, while tDNA-PCR divided them into three groups. *Bacillus halodurans* DSM 497T had a different ISR pattern from the isolates, while it had a tDNA-PCR profile similar to the group that shared 99% identity with alkaliphilic *Bacillus* species A-59. All isolates hydrolysed soluble starch as well as amylose, amylopectin and pullulan. The amylase activity (1.2-1.8 U ml<sup>-1</sup>) in the culture broths had an optimum temperature of 55-65 degrees C, was stimulated by 1 mM Ca<sup>2+</sup>, and was either partially (16-30%) or completely inhibited by 1 mM EDTA. Activity staining of the cell-free culture supernatant from the isolates revealed five alkaline active amylase bands.