



## Comparative Analysis and Characterization of Lipase Producing Alkaliphilic Bacteria Isolated from Lonar Soda Lake, India

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**Abstract:** Microbial culture dependent phenotypic and genomic characteristic were observed for lipase producing bacteria. Out of twenty nine isolates; thirteen bacterial strains were obtained lipase producing bacterial strains. These strains were subjected to physiological and standard biochemical characterization along with 16S rDNA sequencing for their identification. The phylogenetic position indicated the bacterial strains were related to phylum Firmicutes and belongs to *Bacillus cereus* OCW31, *Bacillus pumilus* DW21, *Bacillus pseudofirmus* DW41 and *Bacillus flexus* AW32. These four strain selected for production and, partial characterizations of lipase due to maximum lipolytic activity. The lipase was highly stable over a broad temperature from 40 to 90°C and optimum enzyme activity was found to be 70°C for *B. cereus* ICW31. The effect of organic solvents on the lipase activity was determined. The data elucidate that the lipase from *B. flexus* AW32 and *B. pseudofirmus* DW41 was highly active than *B. cereus* OCW31 and *B. pumilus* DW21 in all organic solvents tested. The lipase was enhanced the activity in presence of  $\text{CaCl}_2$ ,  $\text{MnSO}_4$ , for *B. pseudofirmus* DW41 and *B. pumilus* DW21 while  $\text{NiCl}_2$  enhanced the lipase activity produce by *B. pseudofirmus* DW41 and *B. cereus* OCW31. The information for enzyme production and optimization of lipase has a bright future towards the improvement and production of novel enzymes for biotechnological potential.

**Keywords:** Lonar lake, Lipase, Alkaliphilic bacteria, Bacillus

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