

Kambura AK, **Mwirichia RK**, Ngaira J, Boga HI. 2013. Isolation and characterization of bacterial isolates from Lake Magadi. *J. Trop. Microbiol. Biotechnol.* 8:17-25 17

Abstract

Microorganisms from soda lakes have attracted attention as a possible source of novel enzymes and metabolites for use in industrial applications. Isolation and characterization of bacteria from Kenyan soda lakes has been done mainly in Lakes Elmenteita, Bogoria and Nakuru. Only a few studies have been documented on Lake Magadi, a hyper saline lake with up to 30% salinity levels. This study sought to isolate alkaliphilic bacteria from Lake Magadi that could produce novel enzymes and antimicrobial compounds, and document for further exploitation. Nearly 55 isolates were obtained using different media prepared with filter-sterilised water from the lake, which were characterized and screened for production of extracellular enzymes and/or antimicrobial compounds. Bacteria retrieved grew well at pH ranging from 5 – 10, temperature range of 25 – 50 oC and sodium chloride range of 0- 30 %. The isolates produced amylases, lipases, proteases and esterases and exhibited a range of inhibitory effects on various test organisms. Analysis of partial sequences of 16S rRNA genes using Blast showed that 80 % of the isolates were affiliated to the genus *Bacillus*, while 20% were affiliated to members of *Gammaproteobacteria*. Five (5) isolates showed identity of 95 - 97 % similarity with the previously known sequences and could represent novel bacterial species, while 4 isolates had a sequence identity of 80 - 93% similarity to known organisms, and could represent novel genera. This study demonstrated that the extreme environment of Lake Magadi harbors novel alkaliphilic bacteria with potential for production of enzymes and antimicrobial compounds.

Keywords: Soda lakes, Alkaliphiles, extreme environment, enzymes and antimicrobial compounds