

BACTERIA ISOLATED FROM LAKE MAGADI SOIL WITH POTENTIAL FOR UTILIZATION OF DIFFERENT SUBSTRATES

BETT SYLVYA CHEPKEMOI
B132/12023/2015

Supervisors

Prof. Romano Mwirichia

Dr. Julius Mugweru

Abstract

There is a wide distribution of soda lakes in the world, but most are found in arid and semi-arid areas. Soda lakes contain high salt concentration with a high pH. This study was done in Lake Magadi, located in the southern part of the Kenyan Great Rift Valley and it is the most hypersaline of soda lakes in the valley. Many industries are experiencing challenges with plastics they use in their processes. Disposing the plastics is the biggest challenge since they do not degrade thus causing pollution. Haloalkaliphiles can produce polyhydroxyalkanoates which is used to make alternative form of plastics which are readily biodegraded and thus reduces pollution. Polyhydroxyalkanoates products can also be recycled and this reduces the cost of production. The purpose of this study was to find out whether the bacteria found in the soils of Lake Magadi can produce metabolites of environmental and industrial importance. This was achieved by screening the soil for the halophilic bacteria with important application in industry and environment, studying their morphology, biochemical characteristics and their substrate utilization ability. Isolation was done by culture dependent method where the bacteria from the samples were grown in the oatmeal and actinomycetes media prepared in the lab. Biochemical characterization entailed identification of the bacteria's Gram status. A variety of substrates were used to test the ability of the bacteria to produce enzymes that can utilize or degrade some important macromolecules, they include; starch, CMC, cellulose, lignin, tween 20, xanthan, chitin, skim milk and pectin. A total of 18 isolates were obtained and all of them were gram positive, two of them were rods while the remaining 16 were cocci. Seven isolates utilized starch, 3 were able to utilize skim milk, 5 degraded lignin, 5 utilized tween 20, 2 degraded chitin and none of the isolates was able to utilize cellulose, CMC, xanthan and pectin. This study produced bacterial isolates that can be used for further biotechnological research and also produced enzymes of important industrial applications.