EFFECT OF CULTURAL CONDITIONS AND PHYSICAL FACTORS ON PRODUCTION OF ANTIBIOTIC METABOLITES BY SELECTED ACTINOMYCETES

Waithaka P.N.,

Kirinyaga University, KENYA

Correspondence; *pnjenga@kyu.ac.ke*

ABSTRACT

Antibiotic resistance is one of the biggest global problem of our times. The leading producers of antibiotics that can be used to curb this problem are actinomycetes. This study sought to isolate antibiotic producing actinomycetes from the soils of Menengai crater and identify the cultural and physical factors that favoured production of antibiotics by selected actinomycetes. Soil samples were collected from 32 randomly selected sampling points within Menengai crater and actinomycetes isolated using serial dilution technique and tested for antagonism against selected bacterial and fungal pathogens using primary and secondary screening bioassays. Based on broad spectrum of activity and the size of zone of inhibition, four potent actinomycetes were selected for further studies. The effect of growth media, pH, temperature, incubation period, aeration, inoculum concentration, carbon source, nitrogen source and salt concentration on growth and production of antibiotic metabolites was determined. The isolated presented varying morphological characteristics. There was a significant difference in the diameters of zones of inhibition produced by the test pathogens when subjected to antibiotic metabolites from the selected actinomycetes ($F = 6.6046$ $P = 0.001338$). The growth and production of antibiotics by the selected actinomycetes was favoured by use of Luria Bertani as the culture medium, a pH of 6, incubation temperature of 28^{o}C, incubation period of 7d, aeration rate of 200rpm, inoculum concentration of 1%, glycerol as carbon source, oat meal as nitrogen source and a salt concentration of 1.5%. There is need to carry out structure elucidation of the antibiotics from the selected actinomycetes.

Keywords: *Actinomycetes, Antibiotics, Culture, Extraction, Sensitivity.*