

Phenol Biodegradation by Two Bacterial Isolates From Agricultural Soil

Fatemeh Nafian Dehkordi*; Sara Gharavi; Mohammad Reza Soudi

Department of Biology, Faculty of Science, Alzahra University, Tehran, Iran

fdmicroman@gmail.com

Background & Objectives: Aromatic compounds, with toxic effects on most organisms, are the largest category of materials resistant to degradation. For microorganisms however, the biodegradation of these compounds goes through the carbon cycle. Although, genetic engineering techniques are currently utilized to enhance the abilities of bacteria for bioremediation, the biochemical potentials of the microorganism should first be established. In this study, the ability of phenol biodegradation was investigated by two isolated bacteria from agricultural soil samples.

Methods: The GSN3 and GSN5 isolates were inoculated in a mineral culture consisting of 500 mg/l phenol as the sole carbon source and energy. Growth was monitored by optical density measurements at 600nm every 12 h and was followed up to 72 h. The GSN3 and GSN5 isolates reached the highest OD 0.8 and 0.7, respectively, after 14 hours and after 72 hours. The OD rates were assessed at concentrations of 1000 and 2000mg / l phenol after 72 hours.

Results: The OD of culture broth of GSN3 and GSN5 isolates was 1.45 and 0.98, at a concentration of 1000mg / l phenol respectively, and was 0.19 and 0.17 at the concentration of 2000mg /L of phenol, respectively. Based on the increase in growth kinetics, an estimate of phenol degradation by the two isolates in the media was calculated and shown to be promising. However, further investigation is required to quantitatively evaluate the potential of the isolated bacteria vis-à-vis phenol bioremediation.

Keywords: Bioremediation; Phenol Biodegradation; Spectrophotometry

