

A Survey on Diversity of Heavy Metals Resistant Bacteria Using the RISA

Mostafa Amopour Bahnamiry*; Hosein Motamedi; Abolghasem Hedayatkah;

Department of Biology, Faculty of Science, Shahid Chamran University, Ahvaze, Iran

amopour@gmail.com

Background & Objectives: Heavy metals are one of the most important pollution sources in soil, water and industrial wastewater which their severe toxic effects have adverse impacts on organisms particularly microorganisms. Bacteria act as the first and fastest biological respondents to heavy metals. This study is aimed at investigating the diversity of heavy metal resistant bacteria in heavy metal contaminated wastewater using RISA Methods.

Methods: To achieve this purpose, 20 ml of industrial wastewater contaminated with heavy metals was filtrated and then the filter paper was transferred to 100 ml Nutrient Broth supplemented with specific amounts of salts of aluminum, molybdenum and lead. The flasks were shaken for 1 week at 25° C and 150 rpm. Afterwards, 1 ml of this culture inoculated to 49 ml NB without heavy metals as subculture and incubated at same conditions as the pervious. Then the sediments of 1 mL media were collected in order to extract the DNA using Proteinase K and CTAB Methods. PCR was performed for bacterial ITS region using general primers and its products were subsequently electrophoresed using 5% PAGE and stained with Gel Red®. Finally, the image was taken and analyzed with FireReader software (UVIttec, UK) and its Shannon-Weaver index was determined.

Results: The results showed low bacterial diversity that could be a consequence of disastrous impacts of heavy metals toxicity. Moreover, this fact that heavy metals elicited the removal of those bacteria which could not grow in the presence of heavy metal and also being multiple metals could be other causes of low bacterial diversity.

Conclusion: These results showed that RISA which is a simple and fast Methods can alternatively attempt to control the bacterial diversity of factories exhausted wastewater and its results can be used as an indicator for the safety of treated wastewater, the performance of the pretreatment Methods and the management of heavy metal contaminated wastewater.

Keywords: Bacterial Diversity; Heavy Metal; Industrial Wastewater; RISA