DIVERSITY OF CULTURABLE EXTREMELY HALOPHILIC PROKARYOTES IN ARAN-O-BIDGOL SALT LAKE, A HYPERSONAL PLAYA IN IRAN

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Background: Diversity studies have been traditionally dependent on culture of microorganisms; however, in the recent years culture-independent techniques have been developed. For biotechnological purposes it is still necessary to isolate and grow on pure culture the microorganisms. The polyphasic approach for diversity studies is generally accepted as an approach for the characterization of the microbial diversity of different environments.

Objective: To determine the diversity of culturable extremely halophilic prokaryotes (Archaea and Bacteria) in Aran-o-Bidgol salt lake in Iran.

Methods: Samples from nine different sites in the lake were cultured on different media. Genomic DNA was extracted and the 16S rRNA genes were PCR amplified by using universal primers for Bacteria and Archaea. Amplified 16S rRNA were sequenced and phylogenetic tree was constructed by the neighbour-joining method.

Results: A total of 806 isolates were isolated and identified as extremely halophilic. Forty colonies of three sampling sites were selected randomly and their complete 16S rRNA sequences were determined. Most of them (30 strains) belonged to Halorubrum. Other strains were related to the genera Halosarsina (2 strains), Haloarcula (2 strains), Halalkalicoccus, Natrinema and Halorhabdus (each containing 1 strain). Only two extremely halophilic isolates were bacteria: one of them was clustered with Salinibacter and other with Rhodovibrio.

Conclusions: The prokaryotic diversity in this hypersaline environment is very limited. Haloarchae of the genus Halorubrum are the most common taxa in the lake but we also were able to isolate some extremely halophilic bacteria. Further studies on prokaryotes isolated from other sampling sites as well as the culture-independent approach in order to determine the prokaryotic diversity in this lake as well as the taxonomic characterization by using a polyphasic approach in order to describe new taxa are in progress.