

Isolation and characterization of new extremely halophilic prokaryote from the family Halobacteriaceae

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Abstract:

A new halophilic archaeon designated as EB21T was isolated from a hypersaline lake in Iran. Sampling was carried out in dry season from Aran-o-bidgol salt lake and samples were cultured in 23% MGM medium (Dyall-Smith, 2008). After successive cultivations a pure isolates were obtained. According to anisomycin antibiotic susceptibility the strain were identified as member of domain archaea. The genomic DNA of strain EB21 was extracted by DNA extraction kit (Roche, Germany) according to the manufacturer's recommended procedure and the 16S rRNA gene was amplified using the archaeal universal primers: 21F (5'-TTCCGGTTGATCCYGCCGGA-3') and 1492R (5'-GGTTACCTTGTTACGACTT-3'). Characterization of this strain was achieved by following the minimal standards recommended by Oren et al. (1997) for describing novel taxa of the order Halobacteriales. Strain EB21 is orange pigmented, big pleomorphic shaped, motile and it needs at least 2.5 M NaCl for growing and exhibits optimal growth at 4 M NaCl. The growth of strain is not depended to Mg²⁺ but it grows optimally at 0.2 M MgCl₂. The optimum pH and temperature for growth were pH 7 and 40 °C, respectively. Phosphatidylglycerol and phosphatidylglycerol phosphate methyl ester, as common phospholipids in haloarchaea, were present. Phosphatidylglycerol sulphate, three un-identified glycolipid and one phospholipid were also observed. The strain was resistant to amoxicillin, chloramphenicol, erythromycin, gentamicin, kanamycin, tetracycline and penicillin G and susceptible to bacitracin, nitrofurantoin, novobiocin, rifampicin and anisomycin. 16S rRNA gene sequencing showed that strain EB21 is a member of the family Halobacteriaceae; 16S rRNA gene sequence similarity was as low as 91.8 %, 91.6 % and 91.6% to closely related haloarchaeal taxa including: Halobiforma, Haloterrigena and Halalkalicoccus, respectively. The G+C content of its DNA is 67.7 mol%. The physiological, biochemical and phylogenetic differences between strain EB21 and other previously described genera of extremely halophilic archaea suggest that this novel strain represents a novel species in a new genus within the family Halobacteriaceae, for which the name Halomagnus aurantiacus gen. nov., sp. nov. is proposed.

Key words: Extreme halophiles, Halophilic archaea, Halomagnus