Pseudomonas salegens sp. nov., a halophilic member of the genus Pseudomonas isolated from a wetland

Mohammad Ali Amoozegar,1 Azadeh Shahinpei,2 Abbas Akhavan Sepahy,3,4 Ali Makhoudami-Kakhki,4 Shima Sadat Seyedmahdi,2 Peter Schumann5 and Antonio Ventosa6

1Extremophiles Laboratory, Department of Microbiology, Faculty of Biology and Center of Excellence in Phylogeny of Living Organisms, College of Science, University of Tehran, Tehran, Iran
2Microorganisms Bank, Iranian Biological Resource Centre (IBRC), ACECR Tehran, Iran
3Department of Microbiology, Faculty of Biological Sciences, Islamic Azad University North Tehran Branch, Tehran, Iran
4Department of Biology, Faculty of Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
5Leibniz Institute DSMZ-German Collection of Microorganisms and Cell Cultures, Inhoffenstraße 7B, 38124 Braunschweig, Germany
6Department of Microbiology and Parasitology, Faculty of Pharmacy, University of Sevilla, 41012 Sevilla, Spain

A novel Gram-stain-negative, aerobic, non-endospore-forming, non-pigmented, rod-shaped, slightly halophilic bacterium, designated GBPy5T, was isolated from aquatic plants of the Gomishan wetland, Iran. Cells of strain GBPy5T were motile. Growth occurred with between 1 and 10 % (w/v) NaCl and the isolate grew optimally with 3 % (w/v) NaCl. The optimum pH and temperature for growth of the strain were pH 8.0 and 30 °C, respectively, while it was able to grow over a pH range of 6.5–9.0 and a temperature range of 4–35 °C. Phylogenetic analysis, based on 16S rRNA gene sequences, revealed that strain GBPy5T is a member of the genus Pseudomonas forming a monophyletic branch. The novel strain exhibited 16S rRNA gene sequence similarity of 95.4 % with type strains of Pseudomonas guariconensis PCAVU11T and Pseudomonas sabulinigri J64T, respectively. The major cellular fatty acids of the isolate were C18:1ω7c (37.8 %), C16:0 (14.9 %), C16:1ω7c (12.9 %), C12:0 3-OH (7.1 %) and C12:0 (7.0 %). The polar lipid pattern of strain GBPy5T comprised phosphatidylglycerol, diphosphatidylglycerol, phosphatidylethanolamine and one phospholipid. Ubiquinone 9 (Q-9) was the predominant lipoquinone. The G+C content of the genomic DNA of strain GBPy5T was 59.2 mol%. On the basis of the phenotypic and phylogenetic data, strain GBPy5T represents a novel species of the genus Pseudomonas, for which the name Pseudomonas salegens sp. nov. is proposed. The type strain is GBPy5T (=IBRC-M 10762T=CECT 8338T).

The genus Pseudomonas, which was first described by Migula (1894), accommodates a group of Gram-stain-negative bacteria that are non-endospore-forming, aerobic, motile and rod-shaped (Palleroni, 2005). Pseudomonads are well-known micro-organisms with versatile metabolic activity and have been isolated from various environments like soil, plants, freshwater, clinical specimens and marine habitats (Palleroni, 1992; Romanenko et al., 2005). The taxonomic position of members of the genus Pseudomonas has changed several times (Stanier et al., 1966; Palleroni & Doudoroff, 1972; De Ley, 1992; Anzai et al., 2000). At the time of writing (October 2013) the genus comprises 207 species with validly published names (www.bacterio.net/m/ marinobacter.html; Ezéby, 1997). Several species of the genus Pseudomonas can tolerate NaCl concentrations of up to 8 % (w/v) and are considered to be halotolerant. For a few species, which were first described as members of the