Bacillus litorisediminis sp. nov., a Thermophilic Bacterium Isolated from Mangrove Sediment

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Abstract
Two aerobic, Gram-staining-positive, rod-shaped, endospore-forming, thermophilic bacterial strains, designated FJAT-47801T and FJAT-47835, were isolated from the sediment collected from Zhangjiang Estuary Mangrove National Nature Reserve in Fujian Province, China. Growth was observed at 25–55 °C (optimum, 50 °C) and pH 7.0–9.0 (optimum, pH 7.0), with up to 4.0% (w/v) NaCl (optimum, without NaCl). Strains FJAT-47801T and FJAT-47835 showed the highest 16S rRNA gene sequence similarity to Bacillus oleivorans (98.5%). The 16S rRNA gene sequence similarity between FJAT-47801T and FJAT-47835 was 99.9% indicating they were the same species. Phylogenetic (based on 16S rRNA gene sequences) and phylogenomic (based on 120 conserved bacterial single-copy genes) trees showed that strains FJAT-47801T and FJAT-47835 should be affiliated to the genus Bacillus. The of menaquinone of strain FJAT-47801T was MK-7. The major fatty acids of strain FJAT-47801T were iso-C15:0, anteiso-C15:0, iso-C17:0, and C16:0. The major polar lipids strain FJAT-47801T were phosphatidylethanolamine (PE), diphosphatidylglycerol (DPG), and phosphatidylglycerol (PG). The genomic DNA G+C content of strain FJAT-47801T was 39.3%. The average nucleotide identity (84.3%) and the digital DNA–DNA hybridization value (28.1%) between strain FJAT-47801T and B. oleivorans CCTCC AB 2013353T were below the cut-off level for species delineation. Based on the above results, strain FJAT-47801T represents a novel species of the genus Bacillus, for which the name Bacillus litorisediminis sp. nov., is proposed. The type strain is FJAT-47801T (=GDMCC 1.2712T = JCM 34875T).