
Title

Three Fe(III)-reducing and nitrogen-fixing bacteria, Anaeromyxobacter terrae sp. nov., Anaeromyxobacter oryzae sp. nov. and Anaeromyxobacter soli sp. nov., isolated from paddy soil

Abstract

Three microaerophilic bacterial strains, designated SG22T, SG63T and SG29T were isolated from paddy soils in PR China. Cells of these strains were Gram-staining-negative and long rod-shaped. SG22T, SG63T and SG29T showed the highest 16S rRNA gene sequence similarities with the members of the genus *Anaeromyxobacter*. The results of phylogenetic and phylogenomic analysis also indicated that these strains clustered with members of the genus *Anaeromyxobacter*. The main respiratory menaquinone of SG22T, SG63T and SG29T was MK-8 and the major fatty acids were iso-C15:0, iso-C17:0 and C16:0. SG22T, SG29T and SG63T not only possessed iron reduction ability but also harboured genes (*nifHDK*) encoding nitrogenase. The genomic DNA G+C contents of SG22T, SG63T and SG29T ranged from 73.3 to 73.5%. The average nucleotide identity (ANI) and digital DNA-DNA hybridisation (dDDH) values between SG22T, SG63T and SG29T and the closely related species of the genus *Anaeromyxobacter* were lower than the cut-off values (dDDH 70% and ANI 95–96%) for prokaryotic species delineation. On the basis of these results, strains SG22T, SG63T and SG29T represent three novel species within the genus *Anaeromyxobacter*, for which the names *Anaeromyxobacter terrae* sp. nov., *Anaeromyxobacter oryzae* sp. nov. and *Anaeromyxobacter soli* sp. nov., are proposed. The type strains are SG22T (= GDMCC 1.3185T = JCM 35581T), SG63T (= GDMCC 1.2914T = JCM 35124T) and SG29T (= GDMCC 1.2911T = JCM 35123T). © 2024 The Authors.

Authors

Tang R.; Yang S.; Rao M.P.N.; Xie C.-J.; Han S.; Yang Q.-E.; Rensing C.; Liu G.-H.; Yuan Y.; Zhou S.-G.

Author full names

Tang, Rong (57221861112); Yang, Shang (57226507879); Rao, Manik Prabhu Narsing (57194130370); Xie, Cheng-Jie (57200616618); Han, Shuang (57437647200); Yang, Qiu-E (55847638200); Rensing, Christopher (7004252643); Liu, Guo-Hong (55706607500); Yuan, Yong (55139390300); Zhou, Shun-Gui (23981875800)

Author(s) ID

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Affiliations

Guangdong Key Laboratory of Environmental Catalysis and Health Risk Control, School of Environmental Science and Engineering, Institute of Environmental Health and Pollution Control, Guangdong University of Technology, Guangzhou, 510006, China; Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University,

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Fujian, Fuzhou, 350002, China; Instituto de Ciencias Aplicadas, Facultad de Ingeniería, Universidad Autónoma de Chile, Sede Talca, Talca, 3460000, Chile; Agricultural Bio-resources Research Institute, Fujian Academy of Agricultural Sciences, Fujian, Fuzhou, 350003, China

Authors with affiliations

Tang R., Guangdong Key Laboratory of Environmental Catalysis and Health Risk Control, School of Environmental Science and Engineering, Institute of Environmental Health and Pollution Control, Guangdong University of Technology, Guangzhou, 510006, China, Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fujian, Fuzhou, 350002, China; Yang S., Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fujian, Fuzhou, 350002, China; Rao M.P.N., Instituto de Ciencias Aplicadas, Facultad de Ingeniería, Universidad Autónoma de Chile, Sede Talca, Talca, 3460000, Chile; Xie C.-J., Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fujian, Fuzhou, 350002, China; Han S., Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fujian, Fuzhou, 350002, China; Yang Q.-E., Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fujian, Fuzhou, 350002, China; Rensing C., Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fujian, Fuzhou, 350002, China; Liu G.-H., Agricultural Bio-resources Research Institute, Fujian Academy of Agricultural

Sciences, Fujian, Fuzhou, 350003, China; Yuan Y., Guangdong Key Laboratory of Environmental Catalysis and Health Risk Control, School of Environmental Science and Engineering, Institute of Environmental Health and Pollution Control, Guangdong University of Technology, Guangzhou, 510006, China; Zhou S.-G., Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fujian, Fuzhou, 350002, China

Author Keywords

Anaeromyxobacter oryzae; Anaeromyxobacter soli; Anaeromyxobacter terrae; Novel species; paddy soil

Index Keywords

Bacterial Typing Techniques; Base Composition; DNA, Bacterial; Fatty Acids; Ferric Compounds; Myxococcales; Nitrogen-Fixing Bacteria; Nucleotides; Phylogeny; RNA, Ribosomal, 16S; Sequence Analysis, DNA; Soil; cytochrome; fatty acid; ferric ion; ferrous ion; genomic DNA; menaquinone; nitrogenase; nucleotide; bacterial DNA; fatty acid; ferric ion; nucleotide; RNA 16S; Anaeromyxobacter oryzae; Anaeromyxobacter soli; Anaeromyxobacter terrae; Article; bacterial strain; bacterium isolate; bacterium isolation; cell structure; chemotaxonomy; DNA base composition; DNA DNA hybridization; gene sequence; Gram negative bacterium; maximum likelihood method; nitrogen fixation; nitrogen-fixing bacterium; nonhuman; nucleotide sequence; paddy soil; phylogenetic tree; phylogenomics; phylogeny; type strain; bacterium identification; chemistry; DNA sequencing; genetics; Myxococcales; soil

Molecular Sequence Numbers

GENBANK: OM865394, OM865397, OM865402

Chemicals/CAS

ferric ion, 20074-52-6; ferrous ion, 15438-31-0; nitrogenase, 9013-04-1; DNA, Bacterial, ; Fatty Acids, ; Ferric Compounds, ; Nucleotides, ; RNA, Ribosomal, 16S, ; Soil,

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Correspondence Address

G.-H. Liu; Agricultural Bio-resources Research Institute, Fujian Academy of Agricultural Sciences, Fuzhou, Fujian, 350003, China; email: liuguohong624@163.com; Y. Yuan; Guangdong Key Laboratory of Environmental Catalysis and Health Risk Control, School of Environmental Science and Engineering, Institute of Environmental Health and Pollution Control, Guangdong University of Technology, Guangzhou, 510006, China; email: yuanyong@soil.gd.cn; S.-G. Zhou; Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fuzhou, Fujian, 350002, China; email: sgzhou@fafu.edu.cn

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