‘Acidaminococcus timonensis’ sp. nov. and ‘Acidaminococcus massiliensis’ sp. nov. isolated from human gut

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Abstract

We report here the main characteristics of ‘Acidaminococcus timonensis’ strain Marseille-P2764T, isolated from human right colon, and ‘Acidaminococcus massiliensis’ strain Marseille-P2828T, isolated from human duodenum.

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In the context of ongoing work centred on the study of the whole gut human microbiome by culturomics [1] and metagenomics, two bacterial strains that could not be identified by our matrix-assisted desorption ionization–time of flight mass spectrometry (MALDI-TOF MS; MicroFlex, Bruker Daltonics, Wissembourg, France) [2] were isolated in April 2016. Both strains were isolated from the same 60-year-old patient who underwent an upper and lower digestive tract endoscopy to investigate severe anaemia. Strain Marseille-P2764T was isolated from a right colon liquid sample, while strain Marseille-P2828T was isolated from a duodenal liquid sample. The patient received clear information and provided signed informed consent. The study was validated by the ethics committee of the Institut Fédératif de Recherche IFR48 under number 09-022.

The initial growth of strain Marseille-P2764T was achieved under anaerobic conditions (AnaeroGen Compact; Oxoid, Thermo Scientific, Dartilly, France) after 7-day liquid enrichment of the right colon sample in a blood culture bottle (Plus Anaerobic/F Media, BD BACTEC, Le Pont de Claix, France) previously supplemented with 5 mL of sheep’s blood (bioMérieux) and 5 mL of 0.2 μm filtered (Thermo Fisher Scientific, Villebon-sur-Yvette, France) rumen. The first growth of strain Marseille-P2828T was obtained on 5% sheep’s blood–enriched Columbia agar (bioMérieux) under anaerobic atmosphere (AnaeroGen Compact) at 37°C after 21-day liquid enrichment in a blood culture bottle (BD BACTEC, Plus Anaerobic/F Media) previously supplemented with 5 mL sheep’s blood (bioMérieux) and 5 mL of 0.2 μm filtered (Thermo Fisher Scientific) rumen.

The colony morphology of both strains after 72 hours of anaerobic incubation on blood-enriched Columbia agar was similar. They were circular with entire edges, convex and translucent/whiteish, with a mean diameter of 0.3 mm. No pigment production or haemolysis were registered. Both strains were Gram-negative cocci, with a mean diameter ranging from 0.6 to 0.8 μm. Both strains were nonmotile, non–spore forming and catalase and oxidase negative.

The 16S rRNA gene was sequenced for both strains using fD1-rP2 primers as previously described [3] with a 3130-XL sequencer (Applied Biosciences, Saint Aubin, France). Strain Marseille-P2764T and strain Marseille-P2828T, respectively, exhibited 97.30% and 98.09% sequence identity with...
Acidaminococcus fermentans strain DSM 20731 (NR_074928), the phylogenetically closest species with standing in nomenclature (Fig. 1). Strain Marseille-P2764T and strain Marseille-P2828T showed 97.50% sequence identity, which putatively classifies them as new members of the genus Acidaminococcus in the family Acidaminococcaceae within the phylum Firmicutes [4].

The Acidaminococcus genus was created in 1969 and actually counts as two species with standing in nomenclature: A. fermentans and A. intestini. Cells belonging to this genus are Gram-negative, anaerobic cocci, generally isolated from the digestive tract of mammals [5,6].

On the basis of 16S rRNA gene sequence, we found a divergence of >1.3% for strains Marseille-P2764T and Marseille-P2828T from the phylogenetically closest species with standing in nomenclature. Within them we propose here the creation of the new species ‘Acidaminococcus timonensis’ sp. nov. (tim.on.en’sis, L. masc. adj. timonensis, originating from La Timone, the hospital where the specimen from which the type strain was cultivated was collected) and ‘Acidaminococcus massiliensis’ sp. nov. (mas.si.li.en’sis, L. masc. adj. massiliensis from Massilia, the Roman name of Marseille, where the type strain was isolated). Strain Marseille-P2764T is the type strain of the new species ‘A. timonensis’ while strain Marseille-P2828T is the type strain of the new species ‘A. massiliensis’.

MALDI-TOF MS spectrum

The MALDI-TOF MS spectrum of ‘A. timonensis’ strain Marseille-P2764T and ‘A. massiliensis’ strain Marseille-P2828T are available online (http://www.mediterranee-infection.com/article.php?laref=256&titre=urms-database).

Nucleotide sequence accession number

The 16S rRNA gene sequence for ‘A. timonensis’ strain Marseille-P2764T and ‘A. massiliensis’ strain Marseille-P2828T were
deposited in GenBank under accession numbers LT598562 and LT576399, respectively.

**Deposit in a culture collection**

‘A. timonensis’ strain Marseille-P2764T was deposited in the Collection de Souches de l’Unité des Rickettsies (CSUR, WDCM 875) under number P2764, while ‘A. massiliensis’ strain Marseille-P2828T was deposited in CSUR under number P2828 and in the Deutsche Sammlung von Mikroorganismen und Zellkulturen under number DSM 103158.

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**Conflict of Interest**

None declared.

**References**

[1] Lagier JC, Armougom F, Million M, Hugon P, Pagnier I, Robert C, et al. Microbial culturomics: paradigm shift in the human gut microbiome study. Clin Microbiol Infect 2012;18:1185–93.

[2] Seng P, Abat C, Rolain JM, Colson P, Lagier JC, Gourier F, et al. Identification of rare pathogenic bacteria in a clinical microbiology laboratory: impact of matrix-assisted laser desorption ionization—time of flight mass spectrometry. J Clin Microbiol 2013;51:2182–94.

[3] Drancourt M, Bollet C, Carliz A, Martelin R, Gayral JP, Raoult D. 16S ribosomal DNA sequence analysis of a large collection of environmental and clinical unidentifiable bacterial isolates. J Clin Microbiol 2000;38:3623–30.

[4] Kim M, Oh HS, Park SC, Chun J. Towards a taxonomic coherence between average nucleotide identity and 16S rRNA gene sequence similarity for species demarcation of prokaryotes. Int J Syst Evol Microbiol 2014;64:346–51.

[5] Rogosa M. Acidaminococcus gen. n., Acidaminococcus fermentans sp. n., anaerobic Gram-negative diplococci using amino acids as the sole energy source for growth. J Bacteriol 1969;98:756–66.

[6] Jumas-Bilak E, Carlier JP, Jean-Pierre H, Mory F, Teyssier C, Gay B, et al. Acidaminococcus intestini sp. nov., isolated from human clinical samples. Int J Syst Evol Microbiol 2007;57:2314–9.