NEW SPECIES

‘Caecibacter massiliensis’ gen. nov., sp. nov., isolated from human right colon

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Abstract

We report here the main characteristics of ‘Caecibacter massiliensis’ strain Marseille-P-2974T (CSUR P2974), which was isolated from a human right colon sample.

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In the context of an ongoing culturomics [1] and metagenomic study which targets the modifications of the human microbiome in the different gastrointestinal tracts, we isolated from a right colon lavage sample of a 27-year-old obese patient a bacterial strain that escaped identification by our systematic matrix-assisted desorption ionization–time of flight mass spectrometry (MALDI-TOF MS) on a Microflex spectrometer (Bruker Daltonics, Bremen, Germany) [2]. The patient provided signed informed consent, and the study was validated by the ethics committee of the Institut Fédératif de Recherche IFR48 under number 2016-010.

Strain Marseille-P2974T first growth was obtained on 5% sheep’s blood—enriched Columbia agar medium (bioMérieux, Marcy l’Etoile, France) under anaerobic atmosphere (anaeroGEN, Oxoid, Dardilly, France) after a 7-day enrichment of the fresh right colon lavage sample in an anaerobic hemoculture bottle (Becton Dickinson, Pont de Claix, France) added with 5 mL of sterile sheep’s blood (bioMérieux) and 5 mL of 0.2 μm filtered (Thermo Fisher Scientific, Villebon-sur-Yvette, France) rumen at 37°C.

After 96 hours of anaerobic incubation on 5% sheep’s blood—enriched agar (bioMérieux) at 37°C, colonies were circular and convex, with entire edges and whitish in colour. Mean diameter was 0.2 to 0.8 mm. Neither haemolysis nor pigmentation was observed.

Bacterial cells were Gram-negative, nonmotile cocci with a mean diameter ranging from 0.8 to 1.2 μm. Strain Marseille-P2974T tested catalase and oxidase negative. Different temperatures (20, 28, 37, 45 and 55°C) and atmospheres (anaerobic, microaerophilic (CampyGEN, Oxoid) and aerobic conditions) were tested on 5% sheep’s blood—enriched Columbia agar (bioMérieux). Growth was achieved only under anaerobic atmosphere at 37°C. Sporulation test (20 minutes at 80°C) was negative.

The 16S rRNA gene was sequenced using fD1-rP2 primers as previously described [3], using a 3130-XL sequencer (Applied Biosciences, Saint Aubin, France). Strain Marseille-P2974T exhibited a 94.24% sequence identity with Megasphaera cerevisiae strain JCM 6130T (GenBank accession no. LC037207), the phylogenetically closest species with standing in nomenclature (Fig. 1), which putatively classifies it as a member of a new genus within the family Veillonellaceae in the phylum Firmicutes.

The family Veillonellaceae comprises six genera with validated and published names (Allisonella, Anaeroglobus, Dialister, Megasphaera, Veillonella and Negativicoccus). Members of this family are

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characterized by being Gram-negative cocci or coccobacilli with a microaerophilic or anaerobic metabolism [4]. The closest genus to strain Marseille-P2974T, Megasphaera, was created in 1971, and all its six recognized species possess a strictly anaerobic metabolism [5]. Members of this genus are commonly found in rumen, human and pig intestine (Megasphaera elsdenii), brewery-associated environments (Megasphaera cerevisiae, Megasphaera paucivorans, Megasphaera sueciensis), while Megasphaera micro-nuciformis was isolated from a human liver abscess [6].

On the basis of the 16S rRNA sequence divergence of strain Marseille-P2974T with the phylogenetically closest species with standing in nomenclature [7] we propose here the creation of the new genus ‘Caecibacter’ (Cae.ci.bac.ter, L. neut. n. caecum, ‘the caecum of the large intestine’; N.L. masc. n. bacter, ‘a rod’; N.L. masc. n. Caecibacter, ‘a rod from the large intestine’) for which the strain Marseille-P2974T (= CSUR P2974) is the type strain. Strain Marseille-P2974T is the type strain of ‘Caecibacter massiliensis’ gen. nov., sp. nov. (mas.si.li.en. sis, L. masc. adj. massiliensis, from Massilia, the Roman name of Marseille).

MALDI-TOF MS spectrum

The MALDI-TOF MS spectrum of ‘Caecibacter massiliensis’ strain Marseille-P2974T is available online (http://www...
Nucleotide sequence accession number

The 16S rRNA gene sequence was deposited in GenBank under accession number LT576402.

Deposit in a culture collection

Strain Marseille-P2974T was deposited in the Collection de Souches de l’Unité des Rickettsies (CSUR, WDCM 875) under number P2974.

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Conflict of Interest

None declared.

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