NEW SPECIES

"Raoultibacter massiliensis" gen. nov., sp. nov., a new bacterium isolated from the human gut of a Saudi Bedouin

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Abstract

We propose the description of a new bacterial genus and new bacterial species, *"Raoultibacter massiliensis,"* isolated from a faecal specimen of a 19-year-old healthy Saudi Bedouin.

Keywords: Culturomics, emerging bacteria, human gut microbiota, *"Raoultibacter massiliensis"*, taxonomy
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In 2016, we isolated the Marseille-P2849 strain from the stool of a 19-year-old healthy Bedouin living in Saudi Arabia. This study was part of an effort to explore the human gut microbiota using culturomics [1]. The patient gave a signed informed consent, and the study was validated by the ethics committee of the Institut Federatif de Recherche 48 under number 09-022.

The bacterium could not be identified by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) screening (score <0.7) using a Microflex spectrometer (Bruker Daltonics, Bremen, Germany) [2]. Consequently, we sequenced the 16S rRNA gene of the bacterium using fD1 and rP2 primers as previously described [3].

The stool sample from the Bedouin was subjected in the conditions of culture developed by culturomics [1,4]. The stool was preincubated for 7 days at 37°C in an anaerobic atmosphere in a culture bottle containing blood-enriched Columbia agar liquid medium (bioMérieux, Marcy l'Etoile, France) supplemented with 5 mL of rumen fluid filter-sterilized through a 0.2 µm pore filter (Thermo Fisher Scientific, Villebon sur Yvette, France). The initial growth of the Marseille-P2849^T strain was obtained 4 days after the seeding of the liquid medium in a 5% sheep's blood agar that was incubated at 37°C in anaerobiose generated using AnaeroGen (bioMérieux). *Raoultibacter massiliensis* forms transparent microcolonies on blood agar with a mean diameter of 0.1 to 0.3 mm. Bacterial cells are motile Gram-negative, short rods/coccobacilli ranging in length from 0.8 to 1.2 µm with a mean diameter ranging from 0.4 to 0.6 µm. The Marseille-P2849^T strain was found to be a strictly anaerobic, non-spore-forming coccobacilli and was catalase positive and oxidase negative.

The sequence of the 16S rRNA gene of this strain showed a similarity of 91.4% with *Gordonibacter urolithinfaciens* strain Marseille-AA00211^T and 91.3% with *Gordonibacter pamelaeae* strain 7-10-1-b^T (GenBank accession numbers LT223667 and NR102934, respectively), the phylogenetically closest species with standing in nomenclature (Fig. 1), which putatively classifies the bacterium as a member of a new genus within the family *Eggerthellaceae* that we named *"Raoultibacter." Gordonibacter urolithinfaciens* and *Gordonibacter pamelaeae* are anaerobic, non-spore-forming, Gram-positive coccobacilli isolated

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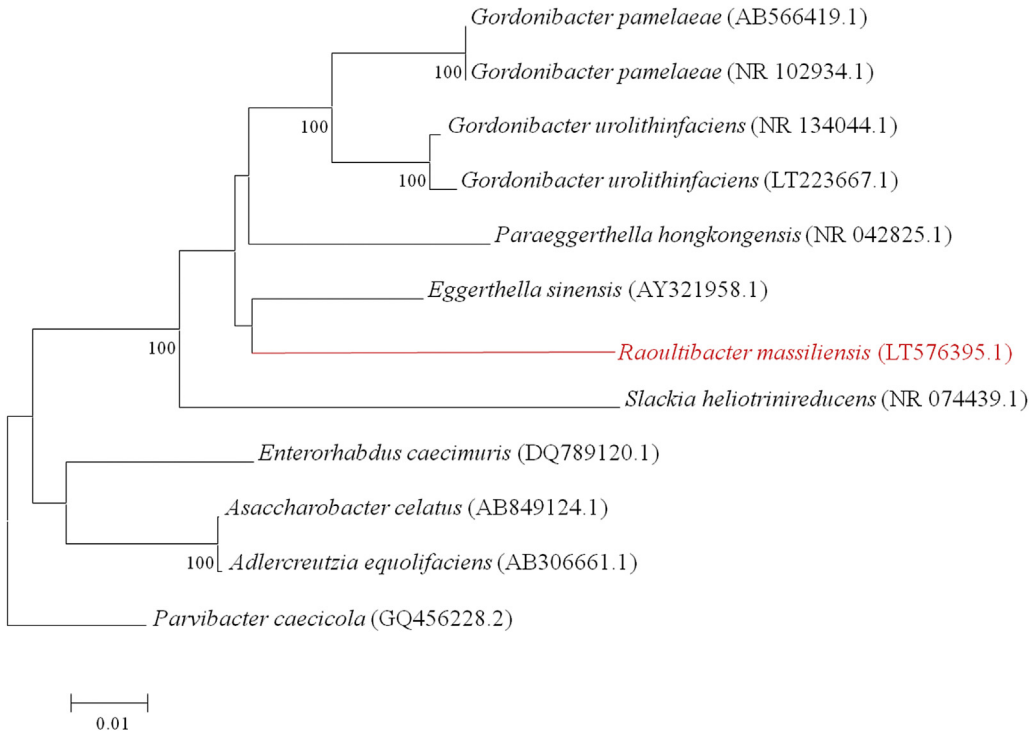

FIG. 1. Phylogenetic tree showing position of *"Raoultibacter massiliensis"* strain Marseille-P2849^T relative to other phylogenetically close species with standing in nomenclature. Sequences were aligned using CLUSTALW, and phylogenetic inferences were obtained using maximum-likelihood method within MEGA software. Numbers at nodes are percentages of bootstrap values (≥95%) obtained by repeating analysis 500 times to generate majority consensus tree. Scale bar indicates 1% nucleotide sequence divergence.

from the healthy human gut and from the colon of a patient with acute Crohn disease, respectively [5,6].

Because strain Marseille-P2849^T exhibits a 16S rRNA sequence divergence of >5% with its phylogenetically closest species with a validly published name with standing in nomenclature [7], we propose the creation of the new genus named *"Raoultibacter"* (ra.ou.l.ti.bac'ter, N.L. masc. gen. n. *Raoultibacter,* composed of *Raoulti,* in honor of French microbiologist Didier Raoult, who created the concept of culturomics, and *bacter,* "bacterium"). Marseille-P2849^T is the type strain of the new species *"Raoultibacter massiliensis"* gen. nov., sp. nov. (mas.i-l.i.en′sis, L. gen. masc. n. *massiliensis,* "of Massilia," the Latin name of Marseille where the strain Marseille-P2849^T was first isolated).

MALDI-TOF MS spectrum accession number

The MALDI-TOF MS spectrum of *"Raoultibacter massiliensis"* is available online (http://mediterranee-infection.com/article.php?laref=256&titre=urms-database).

Nucleotide sequence accession number

The 16S rRNA gene sequence was deposited in GenBank under accession number LT576395.

Deposit in a culture collection

Marseille-P2849^T strain was deposited in the Collection de Souches de l'Unité des Rickettsies (CSUR, WDCM 875) under number P2849.

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Conflict of Interest

None declared.

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