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'*Bacteroides cutis*,' a new bacterial species isolated from human skin

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Abstract

We report the main characteristics of '*Bacteroides cutis*' sp. nov., strain Marseille-P4118^T (= CSUR P4118), a new species within the genus *Bacteroides*. This strain was isolated from a skin sample of a 75-year-old man from Marseille.

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Keywords: *Bacteroides cutis*, culturomics, intensive care unit patient, skin microbiota, taxonogenomics

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In April 2017, as part of the culturomics study to assess the microbial diversity of the human skin [1,2], a new bacterial species was isolated from a skin sample of a 75-year-old man hospitalized in the Nord hospital, Marseille, France. Although the patient was dermatologically asymptomatic, we isolated from his neck a bacterial strain that could not be identified by our systematic matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) screening on a MicroFlex spectrometer (Bruker Daltonics, Bremen, Germany) [3]. The study was approved by the Institut Fédératif de Recherche 48 (agreement number 09-022, Marseille, France), and the patient's consent was obtained.

Strain Marseille-P4118^T was first isolated on 5% sheep's blood-enriched Columbia agar (bioMérieux, Marcy l'Étoile, France) at 37°C in anaerobic atmosphere (AnaeroGen Compact; Oxoid, Thermo Scientific, Dardilly, France) after a 3-day preincubation in an anaerobic bottle of blood culture (Becton Dickinson, Le Pont-de-Claix, France) containing 5% sheep's blood supplemented with 5% rumen fluid previously filter sterilized through a 0.2 µm pore filter (Thermo Fisher Scientific, Villebon sur Yvette, France). Colonies were

colourless, with a diameter ranging from 0.5 to 1.5 mm. Bacterial cells were Gram-negative, motile and rod-shaped bacilli with 0.6 µm wide by 2.8 µm long.

The strain Marseille-P4118^T grew after 48 hours of incubation under anaerobic conditions at a temperature ranging from 28°C to 40°C, but optimally at 37°C. Growth was impossible in microaerophilic (campyGEN; Oxoid) conditions. The bacterial cells tolerated a pH of 6.5 to 7, and a NaCl concentration less than 50 mg/L. After 20 minutes of thermal shock at 80°C, this bacterium did not grow at 37°C on Columbia agar enriched with 5% sheep's blood, confirming the spore search result by microscopy, which was negative. The catalase and oxidase tests for the strain Marseille-P4118^T were negative.

After three failed identifications by MALDI-TOF MS screening on a MicroFlex spectrometer (Bruker Daltonics) [3], the 16S rRNA gene was sequenced using universal primers FDI and RP2 (Eurogentec, Angers, France) as previously described [4] and a 3130-XL sequencer (Applied Biosciences, Saint Aubin, France). Strain Marseille-P4118^T exhibited a 97.4% sequence identity with the type strain *Bacteroides uniformis*, the phylogenetically closest species with standing in nomenclature (Fig. 1). Therefore, strain Marseille-P4118 was classified as a member of the genus *Bacteroides* in the order of *Bacteriodales* within the *Bacteroidetes* phylum. Because the sequence identity with the phylogenetically closest validated species was <98.7%, which is the threshold recommended to define a species according to the nomenclature [5,6], we suggest the creation of a new species named '*Bacteroides cutis*' sp. nov. strain Marseille-P4118^T

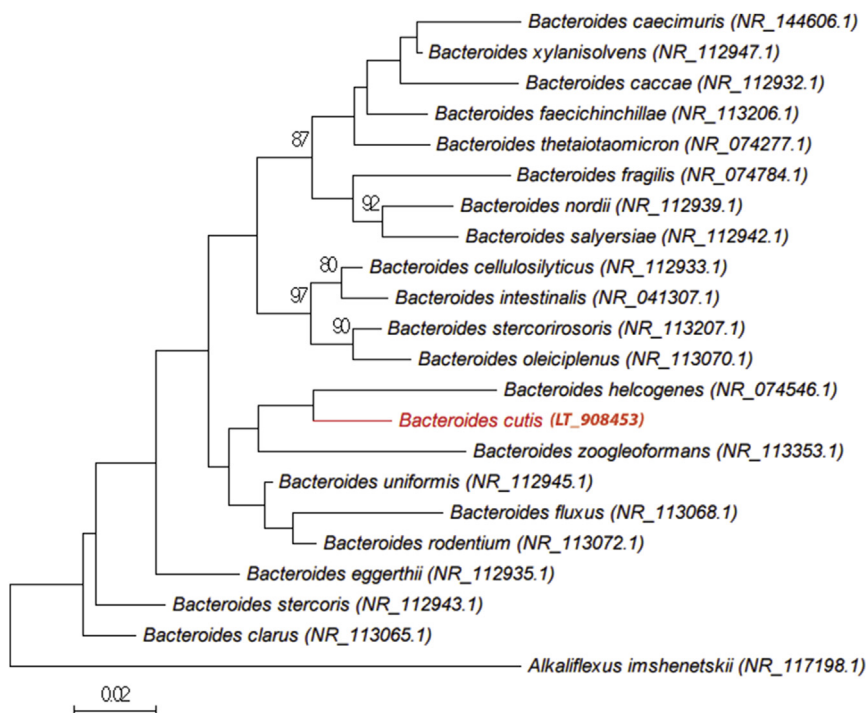


FIG. 1. Phylogenetic tree showing position of ‘*Bacteroides cutis*’ strain Marseille-P4118^T (red) relative to other phylogenetically close neighbours. Sequences were aligned using CLUSTALW, and phylogenetic inferences were obtained using maximum-likelihood method within MEGA software. Numbers at nodes are percentages of bootstrap values obtained by repeating analysis 1000 times to generate majority consensus tree. Only bootstraps scores of at least 95% were retained. Scale bar indicates 2% nucleotide sequence divergence.

(ku.tis, L. fem., from *cutis*, ‘skin,’ the site from which strain Marseille-P4118^T was first isolated).

MALDI-TOF MS spectrum

The MALDI-TOF MS spectrum of ‘*Bacteroides cutis*’ Marseille-P4118^T is available online (<http://www.mediterraneeinfection.com/>).

Nucleotide sequence accession number

The 16S rRNA gene sequence was deposited in GenBank under accession number LT908453.

Deposit in a culture collection

Strain Marseille-P4118^T was deposited in the Collection de Souches de l’Unité des Rickettsies (CSUR) under number P4118.

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Conflict of interest

None declared.

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