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“*Intestinimonas gabonensis*” sp. nov., a new bacterium detected from a Gabonese stool specimen

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Abstract

Detection of new bacteria becomes a major part of culturomics studies coupled with taxonogenomics. Using these strategies, we report here the main characteristics of a new species, “*Intestinimonas gabonensis*” strain GM5. It is a bacterium isolated from a stool specimen from a 27-year-old man from Gabon.

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Keywords: Culturomics, genome, human gut microbiota, “*Intestinimonas gabonensis*” sp. nov., taxonogenomics

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The recently developed strategy of bacterial culture called culturomics provides new information on the repertoire of bacteria found in the human gut flora [1,2]. The application of culturomics coupled with taxonogenomics on a stool specimen from a Gabonese healthy 27-year-old man (body mass index 21.97 kg/m²) permitted the isolation of a new bacterial species, strain GM5. Matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) analysis using a Microflex spectrometer (Bruker Daltonics, Bremen, Germany) failed to identify this species because of the absence of its spectrum in the current database (<http://www.mediterrane-infection.com/article.php?laref=256&titre=urms-database>). After receipt of approval of the National Ethics Committee of Gabon (no. 0023/2013/SG/CNE) and IFR48 of Marseille (no. 09-022) in France, the stool sample was collected under sterile condition in Lébamba, Gabon, in January 2015 and sent to Unité des Maladies Infectieuses et Tropicales Emergentes, Marseille, France, for microbiologic culture.

Strain GM5 was isolated after the stools were cultured in a blood culture bottle (bioMérieux, Marcy l'Etoile, France), followed by a subculture in 5% sheep's blood-enriched Columbia agar (bioMérieux) under anaerobic conditions at 37°C [3–5]. A fusiform Gram-negative bacterium, strain GM5 is nonmotile without oxidase and catalase activities. Its individual cell has a length of 1.5 µm and a diameter of 0.5 µm. Colonies of strain GM5 are translucent and 1 mm in diameter. This bacterium, which is strictly anaerobic and endospore forming, grows in 48 hours under temperatures ranging between 28 and 37°C, with optimal growth at 37°C. Strain GM5 supports a salinity of approximately 0 (range, 0–5%) and pH ranging from 6 and 8.5.

The sequencing the 16S rRNA gene using a 3130-XL sequencer (Applied Biosciences, Saint Aubin, France) and a set of primer rP2-fD1 enabled identification [3–5]. Sequences were corrected and assembled using ChromasPro 1.34 (Technelysium, Tewantin, Australia). Additionally, a BLASTn was performed using the online GenBank database (inist.fr/Blast.cgi). The 16S rRNA gene sequence of strain GM5 exhibited 95.3% sequence identity with the closest species, *Intestinimonas massiliensis* strain GD2, CSUR PI930^T (LN866996) (Fig. 1). Because this value was lower than the threshold recommended to delineate a new species [6], the strain GM5 was putatively classified as a new species called

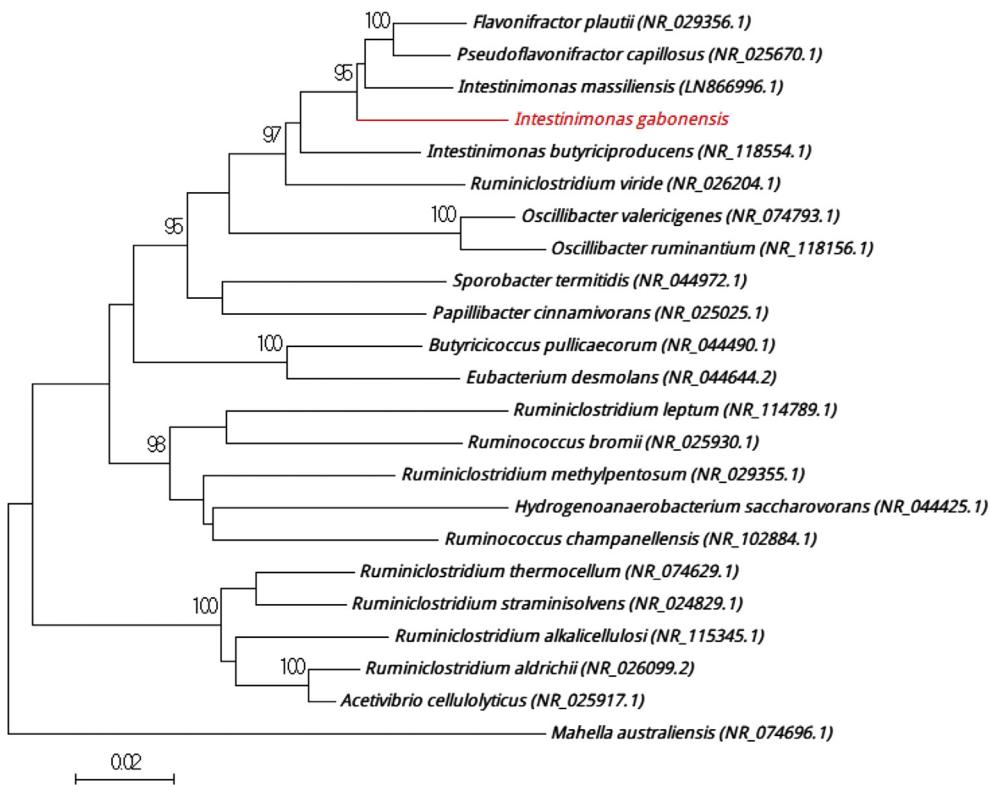


FIG. 1. Phylogenetic tree based on 16S rRNA gene sequence showing position of “*Intestinimonas gabonensis*” sp. nov., strain GM5^T, with other close relative species among Firmicutes phylum. EMBL database accession numbers are indicated in parentheses. Sequences were aligned using CLUSTALW, and phylogenetic inferences were obtained with Kimura two-parameter model using neighbour-joining method with 1000 bootstrap replicates in MEGA6 software. Scale bar represents 1% nucleotide sequence divergence.

“*Intestinimonas gabonensis*” sp. nov. within the genus “*Intestinimonas*” created in 2013 [7].

The neighbouring species of “*I. gabonensis*” stain GM5 (*I. massiliensis* [8], *I. butyriciproducens* [7], *Flavonifractor plautii* [7], *Clostridium orbiscindens* [9]) are anaerobic and endospore forming. Except for *C. orbiscindens*, which is motile, all these species are nonmotile. Gram staining is variable for *Flavonifractor plautii* [7] and *Clostridium orbiscindens* [9] and positive for *I. butyriciproducens* [7].

Because the 16S identity percentage was lower than 98.7% compared to the closest species with a validly published name with standing in nomenclature [6], we propose the creation of the new species “*Intestinimonas gabonensis*” sp. nov., with the species designation named after Gabon, the African country where the stool specimen was collected. GM5 is the type strain of the new species “*Intestinimonas gabonensis*” sp. nov.

Nucleotide sequence accession number

The 16S rRNA gene sequence was deposited in GenBank under accession number LN876649.

Deposit in a culture collection

Strain GM5^T was deposited in the Collection de Souches de l’Unité des Rickettsies (CSUR) under number P2072.

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Conflict of interest

None declared.

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