

'*Pseudomonas saudimassiliensis*' sp. nov. a new bacterial species isolated from air samples in the urban environment of Makkah, Saudi Arabia

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Abstract

We report here the main characteristics of '*Pseudomonas saudimassiliensis*' strain 12M76_air^T (CSUR P1220), a new species of the *Pseudomonas* genus that was isolated from air samples in the city environment of Makkah, Saudi Arabia, during the pilgrim period of Hajj 2012. © 2017 The Authors. Published by Elsevier Ltd on behalf of European Society of Clinical Microbiology and Infectious Diseases.

Keywords: Air isolates, culturomics, new species, '*Pseudomonas saudimassiliensis*' sp. nov., Saudi Arabia

Original Submission: 7 December 2016; **Revised Submission:** 27 December 2016; **Accepted:** 27 December 2016

Article published online: 3 January 2017

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As part of a wider culturomics [1] and metagenomics study [2] in Saudi Arabia we isolated a new bacterium named strain 12M76_air^T from air samples in the urban environment of Makkah, Saudi Arabia, during the pilgrim period of Hajj 2012. For each air sample, a volume of 1000 L was collected with an FCC-IV biological air sampler (AES Laboratories, Combourg, France) mounted with a nutrient agar plate containing the antifungal agent amphotericin (Majed Al-Buqami Co. BMC, Riyadh, Saudi Arabia) according to the manufacturer's instructions. No identification was obtained for strain 12M76_air^T using 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]. Strain 12M76_air^T was cultured in 5% sheep-blood-enriched Columbia agar (bioMérieux, Marcy l'Étoile, France) for 2 days in an aerobic

atmosphere at 37°C. On Columbia agar colonies were opaque, round with grey colour and an average size of 1 mm in diameter. Growth of the strain 12M76_air^T was observed in both aerobic and anaerobic conditions. No growth was observed at pH values of 5.0 and 6.0, whereas growth occurred at alkaline pH with an optimum at pH ≥ 10. Strain 12M76_air^T is a Gram-negative, rod-shaped, motile, catalase- and oxidase-positive bacterium. Cells from fresh colonies grown on agar exhibit a mean diameter of 0.56 µm and a mean length of 1.22 µm in electron microscopy.

The complete 16S rRNA gene was sequenced using fD1-rP2 primers as previously described and a 3130-XL sequencer (Applied Biosciences, Saint Aubin, France) [4]. Strain 20_BN^T exhibited a 98.5% sequence similarity with *Pseudomonas bauzanensis* (NR117232.1), which was the phylogenetically closest species with standing nomenclature (Fig. 1). Consequently, it putatively classifies the strain 12M76_air^T as a new member of the genus *Pseudomonas* within the family *Pseudomonadaceae* in the phylum *Proteobacteria*. The genus *Pseudomonas* was first created in 1894 by Migula and an emended description of the genus *Pseudomonas* was proposed by Yang et al. in 2013 [5]. To date, more than 200 species have been described (<http://www.bacterio.cict.fr/c/pseudomonas.html>). Members of the genus *Pseudomonas* are

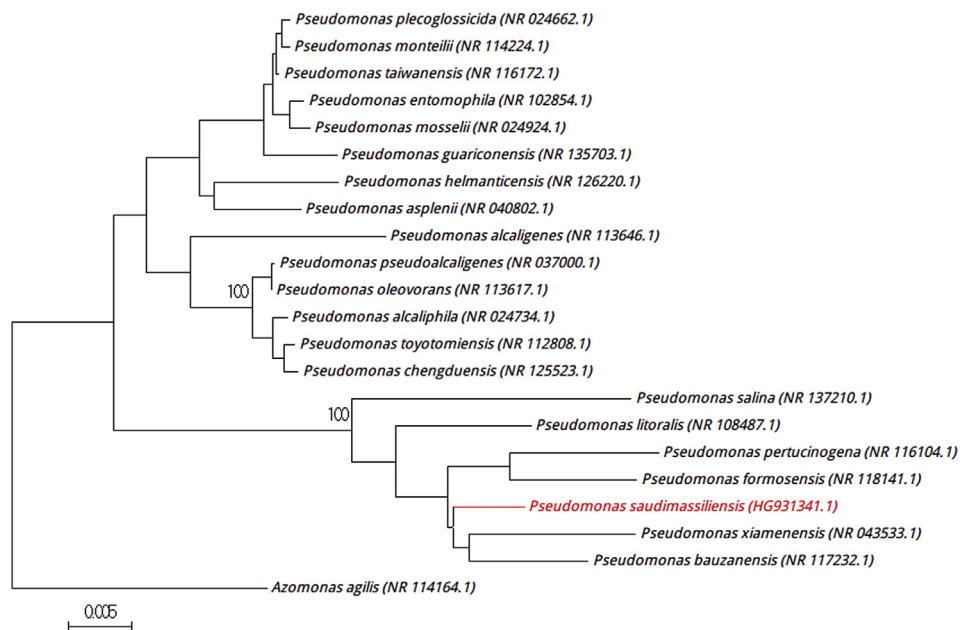


FIG. 1. Phylogenetic tree highlighting the position of ‘*Pseudomonas saudimassiliensis*’ relative to other phylogenetically closest members of the *Pseudomonas* genus. Numbers at the nodes are percentages of bootstrap values obtained by repeating the analysis 500 times to generate a majority consensus tree. Only values >95% are displayed. The scale bar represents a 0.5% nucleotide sequence divergence.

mostly environmental bacteria widely distributed in soil, water and air [6].

Strain 12M76_{air}^T exhibited a 16S rRNA gene sequence divergence >1.3% with *P. bauzanensis*, the most closely related species with standing in nomenclature, which classifies it as a new representative of the *Pseudomonas* genus isolated from air samples from the city environment of Makkah, Saudi Arabia, during the pilgrim period of Hajj 2012. As a result, we propose the creation of ‘*Pseudomonas saudimassiliensis*’ sp. nov., and the strain 12M76_{air}^T as the type strain.

MALDI-TOF MS spectrum accession number. The MALDI-TOF MS spectrum of ‘*Pseudomonas saudimassiliensis*’ strain 12M76_{air}^T is available online (<http://www.mediterranee-infection.com/article.php?laref=256&titre=urms-database>).

Nucleotide sequence accession number. The 16S rRNA gene sequence of the strain 12M76_{air}^T was deposited in GenBank under Accession number LM997413.

Deposit in a culture collection. Strain 12M76_{air}^T was deposited in the Collection de Souches de l’Unité des Rickettsies (CSUR, WDCM 875) under number PI220.

Transparency declaration

The authors have no conflicts of interest to declare.

Acknowledgements

This work was funded by the Deanship of Scientific Research (DSR), King Abdulaziz University, under grant No. (I-141/I433 HiCi). The authors, therefore, acknowledge technical and financial support of KAU.

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