

# Draft Genome Sequences of *Paenibacillus alvei* A6-6i and TS-15

Yan Luo,<sup>b</sup> Charles Wang,<sup>a</sup> Sarah Allard,<sup>a</sup> Errol Strain,<sup>b</sup> Marc W. Allard,<sup>a</sup> Eric W. Brown,<sup>a</sup> Jie Zheng<sup>a</sup>

Office of Regulatory Science, Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administration, College Park, Maryland, USA<sup>a</sup>; Office of Analytics and Outreach, Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administration, College Park, Maryland, USA<sup>b</sup>

**Here, we report draft genomes of *Paenibacillus alvei* strains A6-6i and TS-15, which were isolated, respectively, from plant material and soil in the Virginia Eastern Shore (VES) tomato growing area. An array of genes related to antimicrobial biosynthetic pathways have been identified with whole-genome analyses of these strains.**

Received 29 July 2013 Accepted 5 August 2013 Published 29 August 2013

Citation Luo Y, Wang C, Allard S, Strain E, Allard MW, Brown EW, Zheng J. 2013. Draft genome sequences of *Paenibacillus alvei* A6-6i and TS-15. *Genome Announc.* 1(5):e00673-13. doi:10.1128/genomeA.00673-13.

Copyright © 2013 Luo et al. This is an open-access article distributed under the terms of the [Creative Commons Attribution 3.0 Unported license](http://creativecommons.org/licenses/by/3.0/).

Address correspondence to Jie Zheng, [jie.zheng@fda.hhs.gov](mailto:jie.zheng@fda.hhs.gov).

*Paenibacillus alvei* is a facultative spore-forming Gram-positive bacterium. It is ubiquitously present in the environment and has been isolated from a variety of sources, including cheese (1), fermented tomatoes (2), honey (3), rice plants (4), and soil (5). Many species in the genus *Paenibacillus* have been successfully used for agricultural, horticultural, industrial, and medical applications (6–8). *P. alvei* was also reported to produce peptide antibiotics that affect a wide spectrum of Gram-positive and Gram-negative bacteria (2).

Despite the increasing interest in *Paenibacillus* spp., genomic information for these bacteria is lacking. To date, only one whole-genome sequence has been reported for *P. alvei* in GenBank (9). More extensive genome sequencing might lead to the discovery of a rich source of genes with biotechnological potential. In the present report, we announce the availability of another two draft genomes of *P. alvei*. The two strains, *P. alvei* A6-6i and TS-15, were isolated from plant material and soil, respectively, in the Virginia Eastern Shore (VES) tomato growing area.

Genomic DNA was isolated from an overnight culture of each strain using a Qiagen DNeasy blood and tissue kit (Qiagen Inc., Valencia, CA). Genome sequencing was performed using 454 Titanium sequencing technology (Roche, Branford, CT), achieving >25× average genome coverage. A *de novo* assembly was created for each genome using the 454 Life Sciences Newbler software package v2.5.3 (Roche) and was annotated with the NCBI Prokaryotic Genomes Automatic Annotation Pipeline ([http://www.ncbi.nlm.nih.gov/genome/annotation\\_prok/](http://www.ncbi.nlm.nih.gov/genome/annotation_prok/)). An in-depth comparative genomic analysis of these data will be included in a future publication.

**Nucleotide sequence accession numbers.** The draft genome sequences of strains A6-6i and TS-15 are available in DDBJ/

EMBL/GenBank under GenBank accession no. [ATMS000000000](https://www.ncbi.nlm.nih.gov/nuclot/ATMS000000000) and [ATMT000000000](https://www.ncbi.nlm.nih.gov/nuclot/ATMT000000000), respectively.

## ACKNOWLEDGMENT

The publication was made possible by FDA Foods Program intramural funds.

## REFERENCES

1. Roman-Blanco C, Sanz-Gomez J, Lopez-Diaz T-M, Otero A, Garcia-Lopez M-L. 1999. Numbers and species of *Bacillus* during the manufacture and ripening of Castellano cheese. *Milchwissenschaft* 54:385–388.
2. Anandaraj B, Vellaichamy A, Kachman M, Selvamanikandan A, Pegu S, Murugan V. 2009. Co-production of two new peptide antibiotics by a bacterial isolate *Paenibacillus alvei* NP75. *Biochem. Biophys. Res. Commun.* 379:179–185.
3. Cooper RA, Jenkins L. 2009. A comparison between medical grade honey and table honeys in relation to antimicrobial efficacy. *Wounds* 21:29–36.
4. Mano H, Tanaka F, Nakamura C, Kaga H, Morisaki H. 2007. Culturable endophytic bacterial flora of the maturing leaves and roots of rice plants (*Oryza sativa*) cultivated in a paddy field. *Microbes Environ.* 22:175–185.
5. Caesar-TonThat T, Busscher W, Novak J, Gaskin J, Kim Y. 2008. Effects of polyacrylamide and organic matter on microbes associated to soil aggregation of Norfolk loamy sand. *Appl. Soil Ecol.* 40:240–249.
6. McSpadden Gardener BB. 2004. Ecology of *Bacillus* and *Paenibacillus* spp. in agricultural systems. *Phytopathology* 94:1252–1258.
7. Boland WE, Henriksen ED, Doran-Peterson J. 2010. Characterization of two *Paenibacillus amylolyticus* strain 27C64 pectate lyases with activity on highly methylated pectin. *Appl. Environ. Microbiol.* 76:6006–6009.
8. Ghio S, Lorenzo D, Lia V, Talia P, Cataldi A, Grasso D, Campos E. 2012. Isolation of *Paenibacillus* sp. and *Variovorax* sp. strains from decaying woods and characterization of their potential for cellulose deconstruction. *Int. J. Biochem. Mol. Biol.* 3:352–364.
9. Djukic M, Becker D, Poehlein A, Voget S, Daniel R. 2012. Genome sequence of *Paenibacillus alvei* DSM 29, a secondary invader during European foulbrood outbreaks. *J. Bacteriol.* 194:6365. doi:10.1128/JB.01698-12.