

Draft Genome Sequence of *Kozakia baliensis* SR-745, the First Sequenced *Kozakia* Strain from the Family *Acetobacteraceae*

Jochen Schmid,^a Steven Koenig,^a André Pick,^a Fabian Steffler,^a Shosuke Yoshida,^b Kenji Miyamoto,^b Volker Sieber^a

Chemistry of Biogenic Resources, Technische Universität München, Straubing, Germany^a; Department of Biosciences and Informatics, Keio University, Yokohama, Kanagawa, Japan^b

J.S. and S.K. contributed equally to this work.

Kozakia baliensis belongs to the family *Acetobacteraceae* and was described for the first time in 2002. These acetic acid bacteria are able to produce acetic acid from various carbon sources and 2- and 5-keto-D-gluconate from glucose. The novel *K. baliensis* strain SR-745 was isolated from a pineapple fruit bought in a German supermarket. The strain produces large amounts of organic acids when grown on glucose-containing medium and accepts also glycerol, fructose, mannitol, and sucrose as a C source. When grown under light and high-oxygen conditions in submerged culture, the production of a pink pigment is observed after 72 h.

Received 27 May 2014 Accepted 6 June 2014 Published 26 June 2014

Citation Schmid J, Koenig S, Pick A, Steffler F, Yoshida S, Miyamoto K, Sieber V. 2014. Draft genome sequence of Kozakia baliensis SR-745, the first sequenced Kozakia strain from the family Acetobacteraceae. Genome Announc. 2(3):e00594-14. doi:10.1128/genomeA.00594-14.

Copyright © 2014 Schmid et al. This is an open-access article distributed under the terms of the Creative Commons Attribution 3.0 Unported license.

Address correspondence to Jochen Schmid, j.schmid@tum.de.

ozakia baliensis SR-745 was obtained by classical microbiological isolation techniques from a pineapple bought in a German supermarket. The strain was identified as a Kozakia strain by 16S rRNA analysis. A BLAST analysis indicated that K. baliensis NBRC 16679 (100% identity in 16S rRNA) is its closest neighbor (1). The whole-genome shotgun sequence of K. baliensis SR-745 was obtained by one Illumina MiSeq run and one Illumina GAIIx run independently performed in Germany and Japan, respectively, based on the same DNA sample. The genomic DNA of K. baliensis SR-745 was obtained using an adapted method of Chen and Kuo (2), and shearing and library preparation were done in accordance with the Illumina TruSeq DNA sample preparation guide version 2(3); the only noteworthy deviation is the substitution of the step "purify ligation products (gel method only)" with "purify cDNA construct" from the TruSeq small RNA sample preparation guide (4) for the sequencing in Germany.

The sequencing in Germany yielded 1,211,830 paired-end reads, with read lengths ranging from 35 bp to 151 bp (median, 150 bp). The sequencing in Japan yielded 26,561,095 single reads, with an average length of 109 bp. The reads from Germany were trimmed and quality filtered using TrimmingReads.pl (5), cutadapt (6), and DynamicTrim.pl (7). Quality assessment was done using FastQC (http://www.bioinformatics.babraham.ac.uk/ projects/fastqc/) and SolexaQA (7). After processing, 759,574 forward and 919,579 reverse reads remained, with 1,145,218 paired reads and 533,935 singletons. The Japanese reads were trimmed and quality filtered using CLC Genomics Workbench version 6.5.1, and subsequently, TrimmingReads.pl and Dynamic-Trim.pl. After processing, 25,849,107 reads remained. Assemblies of the combined data from Germany and Japan were carried out using Velvet 1.2.08 (8). All k-mer values from 15 to 83 were examined. The assembly using a *k*-mer length of 55 yielded the highest total sequence length $(3,172,521 \text{ bp}; N_{50}, 92,060 \text{ bp}, \text{ without the}$ PhiX contig) and was used for further analyses. The G+C content

of the assembled contigs is 57.5%. The draft genome is made up of 106 scaffolds, which are composed of 114 contigs. Annotation was carried out by uploading the generated scaffolds to RAST (9), which found 3,151 coding sequences comprising 1,390 genes in several subsystems. A total number of 48 RNA genes were detected by RAST analysis. Fifty-five genes were identified in the monosaccharide subsystem, including those for the utilization of ribose and xylose and the metabolism of mannose, galactose, and gluconate and ketogluconate.

Nucleotide sequence accession numbers. This whole-genome shotgun project has been deposited at DDBJ/EMBL/GenBank under the accession no. JNAB00000000. The version described in this paper is version JNAB01000000.

ACKNOWLEDGMENTS

Financial support for traveling was obtained from the German academic exchange service (DAAD) through project 54365152, "Discovery of novel biocatalysts from bacterial consortia."

We thank Mareike Wenning and Christopher Huptas for the MiSeq sequencing in Freising and their helpful tips for processing the generated data. We also thank Sumitaka Hase of Keio University for technical support in the GAIIx sequencing.

REFERENCES

- Zhang Z, Schwartz S, Wagner L, Miller W. 2000. A greedy algorithm for aligning DNA sequences. J. Comput. Biol. 7:203–214. http://dx.doi.org/ 10.1089/10665270050081478.
- Chen WP, Kuo TT. 1993. A simple and rapid method for the preparation of gram-negative bacterial genomic DNA. Nucleic Acids Res. 21:2260. http://dx.doi.org/10.1093/nar/21.9.2260.
- Illumina. 2011. TruSeq DNA sample preparation v2 guide. Illumina, San Diego, CA. http://supportres.illumina.com/documents/myillumina/f5f 619d3-2c4c-489b-80a3-e0414baa4e89/truseq_dna_sampleprep_guide_ 15026486_c.pdf.
- 4. Illumina. 2011. TruSeq small RNA sample preparation guide. Illumina, San Diego, CA. http://supportres.illumina.com/documents/documentation/ch

emistry_documentation/samplepreps_truseq/truseqsmallrna/truseq-smal l-rna-sample-prep-guide-15004197-f.pdf.

- Patel RK, Jain M. 2012. NGS QC Toolkit: a toolkit for quality control of next generation sequencing data. PLoS One 7:e30619. http://dx.doi.org/ 10.1371/journal.pone.0030619.
- Martin M. 2011. Cutadapt removes adapter sequences from highthroughput sequencing reads. EMBnet.journal 17:10-12. http:// dx.doi.org/10.14806/ej.17.1.200.
- Cox MP, Peterson DA, Biggs PJ. 2010. SolexaQA: at-a-glance quality assessment of Illumina second-generation sequencing data. BMC Bioinformatics 11:485. http://dx.doi.org/10.1186/1471-2105-11-485.
- 8. Zerbino DR, Birney E. 2008. Velvet: algorithms for de novo short read

assembly using de Bruijn graphs. Genome Res. 18:821-829. http://dx.doi.org/10.1101/gr.074492.107.

9. Overbeek R, Begley T, Butler RM, Choudhuri JV, Chuang HY, Cohoon M, de Crécy-Lagard V, Diaz N, Disz T, Edwards R, Fonstein M, Frank ED, Gerdes S, Glass EM, Goesmann A, Hanson A, Iwata-Reuyl D, Jensen R, Jamshidi N, Krause L, Kubal M, Larsen N, Linke B, McHardy AC, Meyer F, Neuweger H, Olsen G, Olson R, Osterman A, Portnoy V, Pusch GD, Rodionov DA, Rückert C, Steiner J, Stevens R, Thiele I, Vassieva O, Ye Y, Zagnitko O, Vonstein V. 2005. The subsystems approach to genome annotation and its use in the project to annotate 1000 genomes. Nucleic Acids Res. 33:5691–5702. http://dx.doi.org/10.1093/nar/gki866.