

# Draft Genome Sequence of Coccoid *Lactobacillus equigenerosi* NRIC 0697<sup>T</sup> Isolated from the Gastrointestinal Tracts of Healthy Thoroughbreds

Hidehiro Toh,<sup>a</sup> Akiyo Nakano,<sup>b</sup> Co Thi Kim Nguyen,<sup>c,f</sup> Iyo Mimura,<sup>c</sup> Kensuke Arakawa,<sup>c</sup> Kosuke Tashiro,<sup>d</sup> Takefumi Kikusui,<sup>e</sup> Hidetoshi Morita<sup>c</sup>

Medical Institute of Bioregulation, Kyushu University, Fukuoka, Japan<sup>a</sup>; Department of Microbiology and Infectious Diseases, Nara Medical University, Kashihara, Nara, Japan<sup>b</sup>; Graduate School of Environmental and Life Science, Okayama University, Okayama, Japan<sup>c</sup>; Graduate School of Systems Life Sciences, Kyushu University, Fukuoka, Japan<sup>d</sup>; School of Veterinary Medicine, Azabu University, Sagami-hara, Kanagawa, Japan<sup>e</sup>; College of Education, Hue University, Hue, Vietnam<sup>f</sup>

H.T. and A.N. contributed equally to this article.

***Lactobacillus equigenerosi* NRIC 0697<sup>T</sup> was isolated from the gastrointestinal tracts of healthy thoroughbreds. This strain produced unique spherical or oval cells, which is rare in the genus *Lactobacillus*. Here, we report the draft genome sequence of this strain.**

Received 7 December 2015 Accepted 11 December 2015 Published 4 February 2016

**Citation** Toh H, Nakano A, Nguyen CT, Mimura I, Arakawa K, Tashiro K, Kikusui T, Morita H. 2016. Draft genome sequence of coccoid *Lactobacillus equigenerosi* NRIC 0697<sup>T</sup> isolated from the gastrointestinal tracts of healthy thoroughbreds. *Genome Announc* 4(1):e01679-15. doi:10.1128/genomeA.01679-15.

**Copyright** © 2016 Toh et al. This is an open-access article distributed under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/).

Address correspondence to Hidetoshi Morita, hidetoshi-morita@okayama-u.ac.jp

*Lactobacillus equigenerosi* forms a subcluster in the *Lactobacillus reuteri* group, being closely related to *L. fermentum*, *L. gastricus*, *L. ingluviei*, and *L. mucosae*, in the phylogenetic tree of the genus *Lactobacillus* (1). We previously isolated *L. equigenerosi* NRIC 0697<sup>T</sup> from the feces of two actively racing thoroughbred horses (1) and deposited strain NRIC 0697<sup>T</sup> as JCM 14505<sup>T</sup> and DSM 18793<sup>T</sup> in the Japan Collection of Microorganisms (JCM) and the Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH (DSMZ), respectively. This strain forms coccoid cells but not rod-shaped cells that are found in most lactobacilli (1). *L. equigenerosi* is considered to be specific to equines (2, 3) and has high autoaggregative properties. *L. equigenerosi* may be able to be used as a probiotic for equines, because this species is non-pathogenic and does not elicit an allergic response (3).

The *L. equigenerosi* NRIC 0697<sup>T</sup> genome underwent paired-end sequencing using the Illumina MiSeq platform. Genomic libraries containing 600- to 1,000-bp inserts were constructed and sequenced, yielding 3,584,696 sequences that provided 495-fold coverage from both ends of the genomic clones. The sequence reads were assembled using Newbler version 2.8 (Roche), and the assembled genome consisted of 84 contigs, with a total length of 1,594,458 bp. The genome size was relatively smaller than those of other lactobacilli. The draft genome of *L. equigenerosi* NRIC 0697<sup>T</sup> contained 1,496 predicted protein-coding genes and 43 tRNA genes. The genome information of this species will be useful for further studies of its physiology, morphology, taxonomy, and ecology.

**Nucleotide sequence accession numbers.** The draft genome sequence for *L. equigenerosi* NRIC 0697<sup>T</sup> has been deposited in the DDBJ/GenBank/EMBL database under the accession numbers BCMX01000001 to BCMX01000084.

## ACKNOWLEDGMENT

This research was supported by the Science Research Promotion Fund for Private Universities (2015-2027).

## FUNDING INFORMATION

The Science Research Promotion Fund for Private Universities provided funding to Takefumi Kikusui and Hidetoshi Morita under grant number 2015-2027.

## REFERENCES

- Endo A, Roos S, Satoh E, Morita H, Okada S. 2008. *Lactobacillus equigenerosi* sp. nov., a coccoid species isolated from faeces of thoroughbred racehorses. *Int J Syst Evol Microbiol* 58:914–918. <http://dx.doi.org/10.1099/ijs.0.65250-0>.
- Morita H, Nakano A, Shimazu M, Toh H, Nakajima F, Nagayama M, Hisamatsu S, Kato Y, Takagi M, Takami H, Akita H, Matsumoto M, Masaoka T, Murakami M. 2009. *Lactobacillus hayakitensis*, *L. equigenerosi* and *L. equi*, predominant lactobacilli in the intestinal flora of healthy thoroughbreds. *Anim Sci J* 80:339–346. <http://dx.doi.org/10.1111/j.1740-0929.2009.00633.x>.
- Botha M, Botes M, Loos B, Smith C, Dicks LM. 2012. *Lactobacillus equigenerosi* strain Le1 invades equine epithelial cells. *Appl Environ Microbiol* 78:4248–4255. <http://dx.doi.org/10.1128/AEM.00552-12>.