Effects of Lactobacillus Plantarum TWK10 on Improving Endurance Performance in Humans

Wen-Ching Huang (Ph.D.)\textsuperscript{1\*}, Geng-Jhang Gong\textsuperscript{1}, Yi-Ju Hsu\textsuperscript{2}, Jin-Seng Lin\textsuperscript{3}, Chien-Wen Hou\textsuperscript{4}, Chi-Chang Huang (Ph.D.)\textsuperscript{5\*}

\textsuperscript{1}Department of Exercise and Health Science, National Taipei University of Nursing and Health Sciences, Taiwan
\textsuperscript{2}Graduate Institute of Sports Science, National Taiwan Sport University, Taiwan
\textsuperscript{3}Culture Collection & Research Institute, Synbio Tech Inc.
\textsuperscript{4}Institute of Sports Sciences, University of Taipei, Taiwan
\textsuperscript{5}Corresponding author: wenching@ntunhs.edu.tw; d301090007@gmail.com

Abstract

Introduction: The microbiota is one of a hot topic on disease prevention and health promotion issues and many studies revealed the important roles to physiological homeostasis and health promotion. The \textit{Lactobacillus plantarum} (\textit{L. plantarum}), endemic isolation from Taiwan pickled vegetables, is a well-known probiotic microorganism, i.e., ingested microorganism associated with beneficial effects in the host. A recent animal study demonstrated that \textit{L. plantarum} TWK10 (TWK10) supplementation could increase muscle mass, improve exercise performance, and exert anti-fatigue effects. Therefore, we conducted a human double-blind exercise clinical trial to examine the ergogenic effect of TWK10 supplementation on endurance performance in humans.

Methods: Sixteen adult subjects aged > 20 years were recruited with 8 subjects each randomly allocated to placebo and TWK10 groups, followed by 6 weeks of supplementation with $10^9$ CFU TWK10/day dose. The exhaustive treadmill and related biochemical parameters were conducted and analyzed for their physiological assessments.

Results: The results showed that the TWK10 group exhibited significantly higher endurance performance at a maximal treadmill running test and could be beneficial to energy harvest as compared to Placebo group ($p < 0.05$). In the current study, we demonstrated that TWK10 can be used for aerobic exercise for better physiological adaptation.

Conclusions: TWK10 could be also a potential ergogenic supplement for amateur runners as an alternative option with health benefits.

Keywords: Exercise performance, Lactic acid bacteria, Microbiota, Energy harvest