Effects of *Lactobacillus plantarum* MA2 on cholesterol-lowering *in vivo* and intestinal microflora

Yanping Wang*, Jingrui Wang, Nu Xu

Key Laboratory of Food Nutrition and Safety (Tianjin University of Science & Technology), Ministry of Education, Tianjin, 300457, China

Elevated serum cholesterol is generally a risky factor correlated with the development of coronary artery diseases for humans. In recent years, many studies have shown that fermented dairy products by lactic acid bacteria have the effects on serum cholesterol levels in animal models. So there is reason to believe that probiotic lactic acid bacteria have hypocholesterolemic properties. In our previous studies, we isolated a cholesterol-lowering bacterium MA2 from traditional Tibet kefir grains, and it was identified as *Lactobacillus plantarum*. The vitro experiment showed that this strain has an effective cholesterol-lowering activity. Also, the strain possesses a strong acid and bile salt tolerance and could successfully pass through the artificial gastric and intestine juice.

The objective of this study was to evaluate the effects of *Lactobacillus plantarum* MA2 on cholesterol-lowering and intestinal microflora of rat *in vivo*. Moreover organic acids in fecal was also investigated.

Our results showed that supplementation of *L. plantarum* MA2 to the high-cholesterol diets resulted in a reduction of serum TC, LDL-C, and TG levels of rats and the great reduction in liver cholesterol and TG content. In addition, the number of fecal *Lactobacilli* and *Bifidobacterium* increased in the *L. plantarum* MA2 group which indicated that MA2 could successfully tolerate gastric acid and bile salt and play biological effects. An increase in propionic acid concentration may have altered the cholesterol synthesis pathways and leads the cholesterol concentration to decrease. The results of our study indicate that *L. plantarum* MA2 is a potential probiotic to reduce serum cholesterol, LDL-C, and TG levels. Also, MA2 can contribute to a healthier bowel microbial balance. The exact *vivo* mechanism of reducing cholesterol for *L. plantarum* MA2 should be studied further.

**Key words:** *Lactobacillus plantarum*, cholesterol-lowering, intestinal microflora

**Acknowledgement:** This work was supported by the National Natural Science Foundation of China (grant no. 31101218).

*Corresponding Author:* ypwang40@yahoo.com, ++86-22-60601400, Fax: ++86-22-60601478