

Effects of *Lactobacillus* spp. on Improving the Efficiency of *Gardenia jasminoides* Treatment in *Helicobacter pylori* Infected Mice Model

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Helicobacter pylori infection is associated with chronic gastritis, peptic ulcers, and gastric cancer. About 50% of the population in the world is infected by *H. pylori*. Furthermore, 70% to 95% of *H. pylori*-infected patients are suffering from peptic ulcer. Gardenia has been used as an herbal medicine to treat liver and gall bladder disorders such as hepatitis and acute jaundice, as well as inflammation and fever in Chinese medicine for many years. The effective pharmacological actions, such as protective activity against oxidative damage, as well as cytotoxic, anti-inflammatory, and fibrolytic activities, have been demonstrated. Geniposide is one of the major iridoid glycosides in gardenia fruit and is transformed into genipin by bacterial enzymes in the intestine and then absorbed. In vivo, genipin could also react with amino acids to form the genipin-amino acids complex. In our study, it has showed that the anti-*H. pylori* activity of genipin was as least 10-fold higher than that of geniposide. Therefore, the biotransformed genipin is highly possible to treat or prevent *H. pylori* infection. Microbial enzymes play important roles in biotransformation. β -glucosidase were noted in association with the pharmacological actions of herbal medicines. In this study, a total of 68 *Lactobacillus* spp. field isolates were screened for best β -glucosidase activity. An isolate *Lactobacillus* spp. strain JB-3 showed the best β -glucosidase activity, the enzyme activity was 3 fold higher than other isolates. In mice-infection model, after 14-day-treatment, the infection rate of Gardenia (77.2mg/ml) plus JB-3 (2×10^9 CFU) treatment group was 3-fold lower than the untreated group and was 2-fold lower than the Gardenia (77.2mg/ml) treatment group; the expression of IL-12 was decreased by 50% in Gardenia (77.2mg/ml) plus JB-3 (2×10^9 CFU) treatment group. *Lactobacillus* spp. might improve the biological activity of Gardenin in treating *Helicobacter pylori* infection.

Keywords: β -glucosidase, *Lactobacillus* spp., *Helicobacter pylori*