

Evaluation of anti-bacterial and anti-adherence properties of *Lactobacillus delbrueckii* susp *bulgaricus* on *Escherichia coli*

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Background and Aims: *Escherichia coli* is a food-borne pathogen which can cause diarrhea. Considering emerge of antibiotic resistant, scientists are interested to use new antimicrobial agents in the treatment of diarrhea. Lactic acid bacteria have the great potential to produce antimicrobial compounds that inhibit and control pathogenic bacteria. The aim of this study was to determine the anti-bacterial and anti-adherence properties of *Lactobacillus delbrueckii* susp *bulgaricus* against *Escherichia coli*.

Methods: Using spot on lawn method, the antagonistic effect of *L. delbrueckii* against *E. coli* was examined. The antibacterial activity of cell free supernatant (CFS) of *L. delbrueckii* was investigated using disc diffusion method. To evaluate the effects of pH and lactic acid on the antibacterial activity, pH of CFS was adjusted to 6 in one sample and for the other samples pH was adjusted to that of CFS by adding enough lactic acid to MRS medium (without bacteria). Anti-adherence activity of *L. delbrueckii* was competed with *E. coli* in Caco-2 cell culture.

Results: In spot on lawn method the zone of growth inhibition of *E. coli* by *L. delbrueckii* was 21.1 mm. The zones of growth inhibition for CFS, pH adjusted CFS, pH adjusted MRS medium, negative control (MRS medium) and positive control (cephalexin) were 8.7, 7, 8.5, 7, and 14.5 mm, respectively. Displacement assay showed that *L. delbrueckii* has strong displacement ability toward *E. coli* and reduction of *E. coli* attachment by bounded *L. delbrueckii* was 81.3%.

Conclusions: Evaluation of direct interaction of live bacteria indicated that *L. delbrueckii* had a good inhibitory effect on the *E. coli* growth. According to disc diffusion results, lactic acid was the most potent inhibitory agent produced by *L. delbrueckii*. The results suggest that *L. delbrueckii* may be able to inhibit *E. coli* infection in the gut.

Keywords: Anti bacterial; Lactic acid bacteria; *Escherichia coli*; *Lactobacillus delbrueckii*