Abstract

Objectives: Genetic diversity and resistance of Lactobacillus bulgaricus sbsp. delbrueckii collection with 100 isolates from different home-made yogurt in rural Bulgarian areas were determined. Methods: The strain K98 was the most resistant to bile salts and low pH. Survival and effects on short chain fatty acids production were tested in 20 healthy volunteers. High genetic diversity was observed in the L. bulgaricus collection by RAPD, whereas the ability of tolerate high deoxycholic acid concentrations, and different acid pHs was variable. The strain K98 was selected and used to prepare a homemade yogurt which was administered to 20 healthy volunteers (500 ml/day during 15d). A basal faecal sample and another after yogurt intake were recovered. Results: DGGE experiments, using both universal and Lactic Acid Bacteria (LAB) primers, demonstrated no significant changes in the qualitative composition of gut microbiota. A band corresponding to L. bulgaricus was observed in all 20 samples. Viable L. bulgaricus K98 strain was only recovered in one volunteer. After yogurt intake we found an increase of LAB and Clostridium perfringens, and a decrease of Bacteroides-Prevotella-Porphyromonas. In addition, increases of acetate, butyrate and 2-hydroxy-butyrate acids in faeces were detected. Conclusions: Genetic diversity of L. delbrueckii sbsp. bulgaricus especie is high. We have isolated a probiotic resistant strain to bile and high acidity, L. delbrueckii sbsp. bulgaricus-K98. Qualitative and quantitative changes in the intestinal microbiota are found after ingestion of a homemade yogurt containing this strain, with a concomitant increase in faecal SCFA. Our findings support the interest in developing further studies providing different amounts of L. delbrueckii sbsp. bulgaricus-K98, and should evaluate its clinical effects in human disease.

Keywords