Antagonistic activity against enterotoxigenic *Escherichia coli* infection *in vitro* for three lactic acid bacteria strains from healthy infant stool

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Abstract

Enterotoxigenic *Escherichia coli* (ETEC), is a major cause of diarrhea disease in humans, affecting mainly children in developing countries and travelers from industrialized countries visiting tropical or subtropical areas. ETEC strains have also caused food-borne outbreaks at schools and restaurants. Probiotics are known to be inhibitory to the growth of a wide range of intestinal pathogens in human and animals. They are also able to promote the growth of animals. Possible mechanisms of action include the production of acid and other by-products of bacterial metabolism. In this study, we screened 180 lactic acid bacteria (LAB) strains among isolate from healthy infant stool. Anti-growth activity against ETEC was evaluated using 180 LAB strains with the inhibition zone test. Three LAB strains, ie, strain RY2, MM1 and En4, were significantly shown to inhibit the growth of ETEC T09 and EWD 299. Although strain RY2, MM1 and En4 were identified as *Lactococcus lactis*, *Lactobacillus salivarius* and *Lactobacillus paracasei*, respectively, using API 50 CHL. We isolated three strains, ie, RY2, MM1 and En4, were acid as well as bile tolerant. Then, we studied LAB adhesion *in vitro* cell culture models with intestinal cell lines. Laboratory models using human intestinal cell lines, such as WiDr (HT-29) and C2BBel (Caco-2), have been developed for study of the adhesion of probiotic lactic acid bacteria. We found strain RY2 and MM1 were able to adhere to the culture human intestinal cell lines. Strain En4 was not able to adhere. In order to obtain potential LAB strains for human probiotic use, in this study, LAB strains with survival rates from the simulated GI conditions and with good adhering capability to the intestinal epithelium cells will be then further evaluated for their antagonistic effect against the growth of ETEC using cell culture and animal model.

Key words: Enterotoxigenic *Escherichia coli*, lactic acid bacteria, adhere, cell culture, antagonistic activity