

Study on antagonistic activity against enteropathogenic bacteria infection for lactic acid bacteria

Cheng-Chih Tsai (蔡政志)

Department of Food and Nutrition, Hung Kuang University

Enterotoxigenic *Escherichia coli* (ETEC) and Enteroaggregative *E. coli* (EAggEC) are major causes of sporadic diarrhea disease in humans, affecting mainly children in developing countries and travelers from industrialized countries visiting tropical or subtropical areas. Probiotics are known to be inhibitory to the growth of a wide range of intestinal pathogens in human and 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 and EAggEC were 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 and EAggEC. Although strain RY2, MM1 and En4 were identified as *Lactobacillus acidophilus*, *Lactobacillus salivarius* and *Lactobacillus paracasei*, respectively, using API 50 CHL. We isolated three strains, ie, RY2, MM1 and En4, were acid tolerant as well as bile tolerant. Then, we studied LAB adhesion *in vitro* cell culture models with intestinal cell lines. We found strain RY2, En4 and MM1 were able to adhere to the culture human intestinal cell lines. Antimicrobial activity was performed by incubating the LAB-SCS with ETEC or EAggEC suspension. After 1 hour co-culture, the growth of ETEC and EAggEC was inhibited. In this study, in order to obtain potential LAB strains for human probiotic use, LAB strains with survival rates from the simulated GI conditions, good adhering capability to the intestinal epithelium cells and good antagonistic activity against ETEC and EAggEC using co-culture tests *in vitro*, will be then further evaluated for their antagonistic effect against the growth of ETEC and EAggEC using cell culture and animal model.