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SANAE KAEWNOPPARAT : HUMAN LACTOBACILLI AS ANTI-DIARRHEAL AND ANTICHOLESTEROL BIO-AGENTS : *IN VITRO* AND *IN VIVO* STUDIES. THESIS ADVISORS : MALYN CHULASIRI Ph.D., NONGLUCK SOOKVANICHSILP, Dr.Phm.Sc., AMPOL MITREVEJ, Ph.D., PATRICIA L. CONWAY, Ph.D. 177 P. ISBN 974-662-107-6

Sixty *Lactobacillus* isolates obtained from feces and saliva of children showed the ability to grow in 1% oxgall (bile salt). Among them, *Lactobacillus* HL32, HL49 and HL64 highly affected 9 diarrheagenic pathogens i.e., *Aeromonas hydrophila*, *E. coli*, *Vibrio cholerae*, *V. parahaemolyticus*, *Shigella flexneri*, *Sh. sonnei*, *Salmonella typhimurium*, *S. aureus* and *B. cereus*, and 8 *Lactobacillus* spp. *Lactobacillus* HL49 showed the ability to adhere to organic surfaces i.e., bovine serum albumin, piglet ileal mucus, excised part of mouse intestine, and Caco-2 cells better than *Lactobacillus* HL64 and HL32.

Due to its appreciable properties of inhibition ability and long survival at low pH, *Lactobacillus* HL32 was then selected for further study on its inhibition ability on bacteria. *S. typhimurium* was chosen as a target organism. The supernatant from the growth culture of this organism showed the inhibitory effect at pH about 3.8-4.0. The inhibitory substances produced by *Lactobacillus* HL32 were lactic acid, acetic acid, propionic acid, hydrogen peroxide, proteinaceous substance(s) of greater than 12 kDa. Scanning electron micrographs revealed that *S. typhimurium* treated by the latter substance(s) had rough surfaces and its flagellae were destroyed. At the inoculum size of 2 log cycle higher, *Lactobacillus* HL32 inhibited *S. typhimurium* when mixed together. However, when *Lactobacillus* HL32 and *S. typhimurium* were given simultaneously to the mice, there was no reduction of the latter but the body weight of the tested animals decreased slower than that of mice which received *S. typhimurium* alone.

In anticholesterol study, *Lactobacillus* HL50, HL52, HL53 and HL54 were selected from those isolates which showed capability to reduce cholesterol in culture medium. *Lactobacillus* HL52 and HL54 were then selected to study for their anticholesterol activity in rats treated with high cholesterol diet. There was no significant reduction of blood cholesterol, HDL-cholesterol, LDL-cholesterol or triglyceride in comparison to the control rats. Finally, *Lactobacillus* HL32, HL52 and HL54 were preliminary identified; the first strain was shown to be *L. casei* and the last two strains were *L. fermentum*.

The overall study revealed that human lactobacilli had antidiarrheal and anticholesterol properties. Also, they were shown to be able to adhere to organic surfaces. Therefore, the development of these microorganisms as bio-agents for the treatment of local infectious disease such as diarrhea, and reduction of cholesterol may be possible through further intensive study.