

Inhibition of *Clostridium scindens* and *Clostridium hiranonis* growth by *Bifidobacterium pseudocatenulatum* G4 in simulated colonic pH.

ABSTRACT

In some patients, increased proportions of deoxycholic acid produced by 7α -dehydroxylating in the bile acid pool in the intestines have been associated with the development of cholesterol gallstones. The levels and activities of bile acid 7α -dehydroxylating bacteria have been reported to be increased in gallstone patients. In the current study, the ability of *Bifidobacterium pseudocatenulatum* G4 to survive and tolerate the simulated colonic pH and its inhibitory activity against two 7α -dehydroxylating bacteria, *Clostridium scindens* JCM 10418 and *Clostridium hiranonis* JCM 10541, was investigated. *B. pseudocatenulatum* G4 showed antimicrobial activity against the two tested indicator organisms, however, *B. pseudocatenulatum* G4 showed higher antagonistic activity against *C. hiranonis* as compared with *C. scindens*. Also, the effect of three different colonic pH (5.7, 6.2 and 6.8) on *Clostridium*s and *B. pseudocatenulatum* G4 growth was studied. Reducing the pH leads to 1-2 log decrease in number of both *C. scindens* and *C. hiranonis*. *B. pseudocatenulatum* G4 showed more inhibitory activity against each one of *Clostridium*s compared to mix of them and the effect of pH on *Clostridium* growth was increased by presence of *B. pseudocatenulatum* G4. The highest reduction in *Clostridium* growth observed at pH 6.8 followed by pH 6.2 and 5.7. Good tolerance and survival of *B. pseudocatenulatum* at different levels of pH demonstrating this bacterium as a potential probiotic for human consumption.

Keyword: Antagonistic activity; *Bifidobacterium pseudocatenulatum* G4; *Clostridium scindens*; *Clostridium hiranonis*; Colonic pH