Development of Probiotic Starter Culture/Food Adjunct Using Selected Bifidobacteria*

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Introduction

Bifidobacteria are Gram positive, non acid fast, non spore forming, non motile organism. They are rod shaped but enormously variable in appearance. Bifidobacteria are anaerobic organism but some species can tolerate oxygen only in the presence of carbon dioxide. The organims was first isolated from faeces of breast fed infant. However, they are also found in adult human intestine, vagina and mouth as well as in the alimentary tract of various kinds of animals. Bifidobacteria are known as a probiotic organism. They have been known to produce several prophylactic and therapeutic effects on human as well as animals. These properties include improvement of intestinal microflora, alleviation of lactose intolerance, reduction of serum cholesterol levels, and antitumor and anticarcinogenic activities.

Materials and Methods

Bifidobacteria were isolated from faeces of breast-fed infants and identified using biochemical test and organic acids production. Their antibiotic susceptibility test was conducted against broad range of antibiotics. Their antibacterial activity was conducted against selected food-borne pathogens using double-layered assay. Survival of bifidobacteria in environment simulated to gastrointestinal tract was conducted by exposure to low pH and high concentration of bile. The adhesion of probiotic microorganims onto Caco2 and HT29 cell lines was conducted *in vitro*. Symbiotic relationship of several probiotic microorganims and their inhibitory activity against selected food-borne pathogen was studied using chemostat culture.

Results and Discussion

Bifidobacteria were found dominant in the faeces of breast fed infant. Other bacteria were present in small number. Some strains were found to be able to survive in low pH and in high concentration of bile. The antibacterial activity against selected pathogens was varied among the strains tested. The substances responsible for the inhibitory activity were found to be organic acids as no inhibition observed in buffered medium. The adhesion study of bifidobacteria to human intestinal epithelial cell lines was not encouraging as only one strain was able to adhere to HT29 cell lines. The presence of symbiotic relationship among probiotic microorganisms was proven in chemostat culture. Combination of two-probiotic microorganism showed better inhibitory activity against *E. coli* as compared to monoculture of probiotic microorganism.

Conclusions

This study was designed to select the right strains of bifidobacteria to be used as food adjunct based on several characteristics. However, none of the strains tested fulfill all the requirements outlined in this study. Therefore, combinations of two or more strains of probiotic are strongly recommended to produce superior probiotic products or food adjuncts.

Benefits from the study

Information generated from this study could be used by dairy industries and health food manufacturers in the production of a wide range of products.

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None.

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