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Synbiotic preparation of Probiotic *L. plantarum* MCC2156 with FOS: An improved tool in the management of colorectal cancer

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Abstract

Food formulations of live probiotic cultures with prebiotics are most convenient for functional and nutraceutical applications. Synbiotics , mixtures of probiotics and prebiotics beneficially affect the host . The health promoting capability including inhibitory effects of metabolites produced from the prebiotic fermentation by *L. plantarum* MCC2156 and *L. fermentum* CFR 2192 on cancer cell proliferation and antioxidant activities *in vitro* was evaluated. SCFAs (butyrate, acetate and propionate), the end products of bacterial fermentation of dietary fibers. A detailed investigation on the effects of SCFAs on growth of human colon adenocarcinoma cells, HCT-15 was carried out. The results indicated that, under defined culture conditions, the metabolites produced by *L. plantarum* CFR 2194 and *L. fermentum* CFR 2192 could decrease the cell survival (MTT assay) with IC_{50} value of 196 and 1005 µg/ml after 24 h of incubation. HCT-15 cells when treated with metabolites resulted in appearance of cells in early as well as late apoptotic stages with a minimal number of necrotic cells**.** Increase in the population of cells with sub-G1 DNA content indicated an increase in the apoptotic cells. *In vivo* evaluation of the effect of synbiotic spray dried formulation on DMH induced colon cancer in rats showed an increase in the caecal *Lactobacillus* population and significantly reduced the harmful fecal and colon enzyme (β-glucuronidase and nitroreductase) activities and ammonia concentration. Synbiotic supplementation significantly influenced the maintenance of antioxidant status and reduced aberrant crypt foci proliferation and/or progression, thus signifying the preventive efficacy of synbiotics against colon cancer.

Biography

Dr. S G Prapulla has a doctoral degree in Biotechnology from University of Mysore and postdoctoral experience at Technical University, Berlin, as DAAD scholar. She is currently heading a group of students for their doctoral and post-doctoral work. She has published more than 50 papers in reputed journals. and has been serving as referee for a number of journals of repute. She has more than 10 Indian patents and a few international patents and she is the recipient of UNESCO-ROSTACA young women award. She has successfully transferred a technology on fructooligosaccharides to an Indian sugar industry.

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