ABSTRACT

The human large intestine is a complex, and diverse microbial ecosystem, where an optimal balance exists between the intestinal microflora and its host. Unfortunately, disturbance in the normal intestinal microbial community structure can result in proliferation of pathogens; may develop the symptoms of acute gastroenteritis, colonic cancer etc. The use of diet to fortify certain gut flora components is a popular current aspect of functional food sciences. In this context probiotics, prebiotics and synbiotics all have a significant role. Probiotics are live microbial additions to the diet; prebiotics are foodstuffs that have a selective metabolism in the hindgut, whilst synbiotics are combinations of the two approaches. It has been demonstrated that each of these dietary intervention routes can have an effect on the gut flora “balance”. This approach offers much potential in the prophylactic management of gastrointestinal disorders. Therefore, the present study was undertaken to isolate a lactobacilli culture from indigenous and exogenous sources based on probiotic attributes and to develop a freeze-dried synbiotic product incorporating the selected Lactobacillus culture and prebiotics (inulin and gum acacia). The isolates were identified based on morphological and biochemical characterization, as L. casei subsp. casei, L. brevis of exogenous origin; and L. fermentum and L. plantarum from indigenous sources. Consequently, these cultures were evaluated for in vitro probiotic attributes like resistance to low pH (1.5, 2.0, 2.5 and 3.0), tolerance to bile (1.0, 1.5, 2.0 and 3.0), cell surface hydrophobicity, antimicrobial activity against pathogenic indicator organism and ability to utilize prebiotics (i.e. inulin and gum acacia). Based on these characteristics L. plantarum was selected for the preparation of the lyophilized synbiotic powder incorporating inulin or gum acacia and using non fat dry milk as base material. Throughout refrigerated storage, viability of the probiotic bacteria in the product remained very high numbers of viable counts in the range of 8 to 9 log cfu/g of viable lactobacilli cells even after 90 days; while in the case of room temperature distinct reduction was observed. From the storage study, it is clear that our synbiotic product could serve as a good carrier of probiotic organism.