**Use of protein-polysaccharides based hydrocolloid system for improve targeted delivery of probiotics**

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Nowadays, consumers are more interested towards the diet and health benefit of a product. Probiotics products are being introduced in the market due to health-boosting effects. Probiotics are living microorganisms that ingested in sufficient quantity; benefit the health of the consumer. They provide certain health benefits by improving immune system and inhibiting the growth of pathogenic bacteria in the human body. The main challenge is the survival and viability of probiotics because they lose their viability during gastric transit and storage. *Lactobacillus plantarum* is well known probiotic known to date. Currently research focused on the interaction of protein-polysaccharide interaction and their stability under different environmental conditions. This field opens new horizon to study the texture, behavior and microstructure. The aim of current research was to develop protein-polysaccharide based matrix in different combination to improve survival and viability during gastric transit. Therefore, *Lactobacillus plantarum* (Lp-01) was chosen for microencapsulation with Soy Protein Isolate (SPI) and CMC. T5 (3% SPI + 1.5% CMC) showed maximum encapsulation efficiency >80% as compared to other combinations. The survival and viability of encapsulated *Lactobacillus plantarum* (Lp-01) was investigated through their resistance to simulated gastric juice (SGJ), tolerance to bile salt, release profile in simulated intestinal fluid (SIF) and storage stability during 30 days at 4 °C. The survival rate of free and encapsulated probiotic was 106 Log CFU/ml and 109 Log CFU/ml, respectively. The viable count was significantly higher than non-encapsulated probiotics in simulated gastric juice. The complex of protein-polysaccharides based encapsulates showed maximum viability of probiotics as compared to others. So, protein-polysaccharides in combination is one of the effective encapsulating material for targeted delivery of bioactive compounds.