

Encapsulation of *Lactobacillus casei* 20011 bacteria with alginate/psyllium and evaluation of survival in simulated gastrointestinal conditions

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Background and Aims: Probiotics are Live microorganisms (bacteria or yeasts), which when administered in adequate amounts confer specified demonstrated benefits include controlling intestinal infection, controlling serum cholesterol levels, improving lactose maldigestors. Their efficacy is usually limited by poor bioavailability of viable microorganisms onsite because of GI trace condition. This article focuses on microcapsulation of probiotic with two polymer to improve their viability During gastrointestinal pass. Psyllium is known that it has nutraceutical potential and strong gelling property that reduce the levels of cholesterolemia and has bowel regulating capacity. The addition of psyllium as prebiotic can improved the microecological balance of the gut microflora also it act as coating material.

Methods: Alginate and psyllium were used to encapsulate probiotic by an extrusion method. The efficacy of encapsulation was assessed in simulated gastrointestinal conditions The prepared beads were characterized in terms of size, morphology and surface properties, encapsulation efficiency, viabilities in acid (pH 1.8, 2h) and release in intestinal pH conditions.

Results: This study is the first one using psyllium as coating material for cell delivery. Results this method produce spherical microcapsules with excellent cell loading (more than 99%). Microencapsulated bacteria survival after exposure to simulated gastric juice for 120 min was 75%-81% that is very exelent compare to other similar research. Adding psyllium improve the bacterial survival in simulated gastric environment.

Conclusions: Microcapsulation of probiotic with alginate /psyllium coating offers an effective means of delivery of viable bacterial cells in levels appropriate to the intestinal trace and helps in maintaining their survival during simulated gastric and intestinal juice. Also alginate-psyllium microcapsules could be used as a safe and protective delivery vehicle for administering viable probiotic bacteria.

Keywords: *Lactobacillus casei*; Probiotic; Microcapsulation; Psyllium, Alginate