

***In Vitro* Evaluation of Pectin-Coated Starch Granules for Colonic Delivery**

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ABSTRACT

Glutinous rice starch was prepared in a coated granule formulation by wet granulation for use as a colon-specific starch delivery system. The starch granules were coated with pectin types LC 710 and AMD 382 by ionotropic gelation technique at various ratios at a concentration of 10% weight by weight and dropped in CaCl₂ solution. The pectin coated starch granules with LC 710 alone (1:0) showed the highest effective protection against starch hydrolysis from simulated gastric fluid (0.1 N HCl pH 1.2, 2 h) and small intestine fluid (phosphate buffer solution pH 6.8, 2 h) and then the complete release of the starch granule in simulated colonic fluid (phosphate buffer solution pH 7.4, 4 h). In contrast, granules coated with AMD 382 alone (0:1) did not tolerate the simulated gastric fluid. When granules were coated with a combination of the two pectin types, the effectiveness of starch protection depended on the ratio, with higher ratios of LC 710 over AMD 382 offering more protection.

Glutinous rice starch, prepared in granule form and coated with pectin LC 710, offers potential for development as a nutraceutical product given its ability to tolerate simulated stomach acids and small intestine enzymes and then release the starch when exposed to simulated colonic fluid, where it would be available as a probiotic substrate.

Keywords: Pectin, Starch granules, Colonic delivery, Ionotropic gelation technique

INTRODUCTION

Interest in the development of colon-specific drug delivery systems has increased with the search for better treatments of specific local pathologies as well as for systemic therapy of both conventional and labile molecules. Several methods of potential colonic drug delivery systems, including bead matrices, micro-particles and nano-particles have been studied (Maestrelli et al., 2008). To successfully deliver drugs orally to treat diseases of the colon requires protecting