**Using plant-based complex coacervates to encapsulate probiotic cells in bakery products**

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In recent years, functional foods, especially those containing probiotic microorganisms, have been gaining consumers’ interest. However, probiotics are extremely sensitive to processing conditions employed in food industry2 and therefore it is necessary to develop systems to enhance their viability. There are many microencapsulation systems involving animal proteins, however, there is a growing demand for plant-based protein alternatives1. The aim of this study was the selection of appropriate biopolymers - proteins and polysaccharides - to form complex coacervates and to incorporate them in gel microspheres (beads) to enhance the viability of probiotic cells. The systems that were studied as delivery systems were: a) potato protein and low methoxyl pectin; b) chitosan and gum arabic; c) whey protein isolate and gum arabic; and d) potato protein and pectin complexes exposed to multivalent cations (CaCl2) to form beads (double encapsulation). Several parameters were examined, such as biopolymer ratio, pH, and total biopolymer concentration. Macroscopic assessment and confocal microscopy were employed to assess the optimum conditions for coacervates/beads formation. At the optimal conditions, a probiotic strain (*Lactiplantibacillus plantarum* 2035) was encapsulated and its viability was assessed under stress conditions (low pH, heat treatment, and in vitro digestion protocols). The combination of potato protein and pectin (5:1) in beads (double encapsulation) showed improved encapsulation yield and higher viability of the microorganisms when exposed under the examined stress conditions. The results suggest that the combination of plant-based biopolymers in complex coacervates or beads has the potential to improve the viability of probiotic cultures in bakery products.

*References*

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