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Development of a protein-polysaccharide complex from linseed: An alternative to synthetic surfactant

César Burgos-Díaz¹, Mónica Rubilar^{1,2}, Diego Ramírez², Eduardo Morales¹, José A Piornos¹ and Francisca Acevedo¹

¹Agriaquaculture Nutritional Genomic Center, Chile

²Universidad de La Frontera, Chile

In food industry, the introduction of natural polymers such as proteins and polysaccharides as emulsifying and/or stabilizing agents has been a successful approach for the formulation highly stable emulsions. These biopolymers can interact electrostatically to form protein-polysaccharide complexes which can increase the stability and the surface activity of the protein. Therefore, the objective of this study was to develop a protein-polysaccharide complex (PPC) from linseed to its utilization as emulsifier. The pH and biopolymer concentration for the formation of PPC was established by mixing 0.5 wt% protein solutions with polysaccharide (0-0.5 wt%) at different pH (2-10). These particles were then subjected to a thermal treatment 80°C. These experiments indicated that a 0.2 wt% polysaccharide was sufficient to form a complex stable with 0.5 wt% protein at pH 4 and thermal treatment at 80°C. The complex was characterized by determining of ζ -potential (electric charge) as a function of pH. The values of ζ -potential of PPC were less negative than polysaccharide and more negative than protein. The protein presented positive and negative ζ -potentials when the pH of the solution is lower and higher than 4, respectively. The polysaccharide showed negative ζ -potentials in the pH range of 2-10. Additionally, the ζ -potentials data showed that in the range between pH 2 and 4, the protein and the polysaccharide have opposite charges, and therefore, they can form electrostatic complexes. The biopolymer complex prepared in this study may be useful for encapsulation and delivery of bioactive food components, or as substitutes for synthetic emulsifier.

Biography

César Burgos-Díaz completed his PhD on Biotechnology at University of Barcelona (Spain), where his studies were focused on production and characterization of biosurfactants. Currently, he is a researcher at Agriaquaculture Nutritional Genomic Center (CGNA) in Temuco-Chile. His main research interest is the interaction between ionic biopolymers in order to encapsulate and protect aromatic compounds (flavors). In fact, in 2013 he was granted a FONDECYT postdoctoral project (N°3140001) about encapsulation of flavors specifically related to the evaluation of multilayer emulsions with ionic biopolymers subjected to spray drying. Additionally, he has published different papers in reputed journals.

cesar.burgos@cgna.cl