Use of Plant Seed Galactomannans as Edible Coatings

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Edible films and coatings play an important role in the quality, transportation, storage and display of a wide range of fresh and processed foods. Polysaccharide coatings have an oil-free appearance, a low caloric content and can be used to increase the shelf life of fresh fruits, since they allow the modification of the internal gas composition of fruits, thus retarding its senescence. The objective of this work was to study the ability of seed galactomannans, with different man:gal rations, from different species of Leguminosae (*Caesalpinea pulcherrima* (2.8:1), *Gleditsia triacanthos* (2.26:1) and *Sophora japonica* (5.26:1) to be used as coatings to extend the shelf life of mango (*Mangifera indica*) fruit. To do so, the surface properties of fresh mango, the galactomannans relative viscosity as well as the wetting capacity of the coatings were determined. The mango critical surface tension, determined by the Zisman method, was determined as 22.72 mN/m. The seed endospermic galactomannans were obtained after a heat treatment with boiling ethanol (20 min), followed by manually extraction of the endosperm and solubilization of the gum with water. The soluble material were then precipitated with two volumes of ethanol, and passed thought a nylon net. When the galactomannans safe grade characteristics were determined, by oral administration to Wistar adult rats, no toxic effects were detected. The galactomannans were then mixed with glycerol (plasticizer), at different gum:glycerol proportions and tested as coatings. The wettability (We) of a solid by a liquid is determined by the balance between adhesive (causes the liquid to spread over the solid) and cohesive (cause the liquid to shrink) forces. It was determined using the sessile-drop method. The wettability was calculated with different mixtures of the gums and a plasticizer (glycerol), and the best concentrations for *C. pulcherrima, G. triachanthos* and *S. japonica* gum:glycerol were 1.5% : 2%, 1%:2% and 1%:1.5%, respectively.

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