



Influence of carrier agent concentration on the physicochemical properties and antioxidant capacity of jambo pulp powder

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Syzygium malaccense L. Merry and Perry (red jambo) belongs to the Myrtaceae family and is an original plant from Malaysia. The fruits are succulent, with whitish pulp and peel varying from pink to dark red colors. This fruit has been widely studied due to the presence of bioactive compounds in its chemical composition, mainly phenolic substances such as anthocyanins, which attribute the peel's reddish coloration. However, a big part of the *in natura* fruit is wasted, which encourages the use of its bioactive substances by the food industry. An alternative for the food industry to obtain a stable ingredient from red jambo is the microencapsulation by spray drying. This technique makes use of different encapsulating materials, which promote the protection of bioactive compounds from adverse external environmental conditions. So, the aim of the present work was to evaluate the effect of different encapsulating agents on the physical properties and antioxidant capacity of powdered jambo pulp produced by spray drying. The fruits were collected at Guaratiba, located in Rio de Janeiro city. Jambo fruits were pulped and stored at -18°C. Different formulations were produced according to an experimental mixture simplex-lattice design, where the independent variables were the concentrations of each encapsulating agent (maltodextrin 10DE, gum Arabic and whey protein isolate-WPI). All physical properties (moisture content, water activity and solubility), total phenolic content determined by Folin-Ciocalteu and the antioxidant capacity measured by ORAC method were analyzed immediately after drying. Microencapsulation was carried out in a laboratory scale spray-dryer LabPlant model SD-06AG. Inlet and outlet temperatures were 180°C and 75°C, respectively. All the powders showed low moisture content (2.09-3.49%) and water activity (0.160-0.229), values typically found in products obtained by spray drying. Powders solubility varied between 77 to 96%, values somewhat expected, due to the high water-solubility of the encapsulating agents used. Total phenolic content of the jambo pulp microparticles varied between 620 to 1446 mg.100 g⁻¹ gallic acid equivalent. The particles with the highest values were those obtained with 100% maltodextrin 10DE, 100% gum arabic and 100% WPI. However, analysis of the pure encapsulating agents suggested that WPI, which has a high protein content, can be an interferer in the Folin-Ciocalteu reaction, overestimating the results. The antioxidant capacity measured by ORAC method varied between 20 to 83 μmol Trolox.g⁻¹, and the particles with highest value were those produced with 100% of each encapsulating agent. This result suggest that these encapsulating agents can be related with retention and concentration of phenolics compounds, since this method is based on the transfer of hydrogen atoms, the phenolic compounds being effective hydrogen donors. Thus, from the experimental mixture design, three conditions were selected based on the antioxidant capacity: those produced with 100% maltodextrin, 100% gum Arabic or 100% WPI. The

microparticles produced at this condition is a value-added jambo pulp product, which may be applied as antioxidant in a variety of foods, such as powdered beverages, dairy and bakery products.

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