

Title Suitability of novel galactomannans as edible coatings for tropical fruits
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Abstract

The main objective of this work was to determine the optimal composition of edible coatings in view of their application to extend the shelf life of several tropical fruits. Coatings constituted by galactomannans from different sources (*Caesalpinia pulcherrima* and *Adenanthera pavonina*) and glycerol were characterized as coatings for five tropical fruits: acerola (*Malpighia emarginata*), cajá (*Spondias lutea*), mango (*Mangifera indica*), pitanga (*Eugenia uniflora*) and seriguela (*Spondias purpurea*). The surface properties of the five fruits were determined and different aqueous galactomannan solutions (0.5%, 1.0% and 1.5%) with glycerol (1.0%, 1.5% and 2.0%) were tested for their wettability on fruits. For the solutions having a better wettability, films were casted and water vapour permeability, oxygen permeability, carbon dioxide permeability, tensile strength and elongation at break were determined. Taking into account the surface and permeability properties of the obtained films, four compositions were selected as the best coatings to the studied fruits: acerola - 0.5% of *A. pavonina* galactomannan and 1.0% of glycerol; cajá - 1.0% of *A. pavonina* galactomannan and 1.0% of glycerol; mango and pitanga - 1.5% of *A. pavonina* galactomannan and 1.0% of glycerol; and seriguela - 0.5% of *C. pulcherrima* galactomannan and 1.5% of glycerol. For the coating, the values of the measured properties were as follows: wettability ranged from -36.33 ± 3.39 to $-26.45 \pm 4.58 \text{ mN} \cdot \text{m}^{-1}$; water vapour permeability ranged from 4.89 ± 0.11 to $6.25 \pm 0.20 \times 10^{-11} \text{ g m}^{-1} \text{ s}^{-1} \text{ Pa}^{-1}$; oxygen permeability ranged from 0.31 ± 0.01 to $0.99 \pm 0.13 \times 10^{-15} \text{ g m (Pa s m}^2)^{-1}$; carbon dioxide permeability ranged from 28.81 ± 3.08 to $61.19 \pm 1.44 \times 10^{-15} \text{ g m (Pa s m}^2)^{-1}$; tensile strength ranged from 2.56 ± 0.15 to $3.96 \pm 0.43 \text{ MPa}$; and elongation at break ranged from $28.26 \pm 4.53\%$ to $46.36 \pm 2.29\%$.