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AMARANTH PHENOLIC COMPOUNDS FOR ANTIOXIDANT PRESERVATION AT FOOD INTERFACES

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Abstract

This study explores the preparation of alginate food packaging materials and the incorporation of valuable phenolic compounds extracted from amaranth. Phenolic compounds were extracted with aqueous ethanol. The use of alginates as films in food applications has increased in recent years due to their swelling capacity and overall functionality. The films were produced by casting and characterized in terms of mechanical properties (tensile strength and elongation at break), opacity, water sensitivity (moisture content, solubility and water vapor permeability) and morphology evaluated by scanning electron microscopy. (MEV). The chemical interactions were studied by Fourier Transform Infrared Spectroscopy (FTIR) to evaluate possible chemical modifications of alginate based films after the sorption of amaranth phenolic compounds. The results show films composed of polyphenols such as rutin, isoquercitin and resveratrol, important for human health. In the experimental rotational design (PCCR) carried out 1-2% of the phenolic extracts were sufficient to produce alginate films with high antioxidant capacity. Higher amounts (4-6%) of the extract showed the highest antioxidant activity but lower oxygen permeability and high rigidity and poor extensibility. Phenolic extracts predominantly affected mechanical properties, while others the changes may be mainly related to the lower glycerol content that was partially replaced by the extract. At the end of the study we achieved Amaranth phenolics stabilized in an alginate film as a good barrier food preservative.

Keywords: Amaranthus cruentus, Phenolic compounds, films, experimental design.