MICROSTRUCTURAL, BARRIER AND ANTIMICROBIAL PROPERTIES OF CITRUS PECTIN-BASED EDIBLE FILMS

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ABSTRACT

The main role of food packaging is to protect food products from outside influences (chemical, physical and biological) and preserve their nutritional properties. Petroleum-based polymers and plastics that are most commonly used for this purpose due to their toxicity and their non-biodegradability need to be replaced. Over the last decade, biopolymer-based packaging originating from naturally renewable resources, such as polysaccharides, proteins and lipids has become the focus of food preservation technology. Pectin is an easily accessible polysaccharide that is non-toxic, biodegradable and edible. Due to its gelation capacity it is considered as good matrix for edible film production with application in food packaging. The incorporation of different additives (plasticizers, emulsifiers or cross-linking agents) and active compounds in pectin films could give them good barrier, antimicrobial, nutritional and antioxidant properties.

The present study aims to develop pectin edible films based on citrus peel pectin and oregano essential oil. The oregano essential oil was added to two final concentrations (0.05 and 0.1%). Polyethylene glycol 400 was used as a plasticizer and Tween® 80 was added as a surfactant. Analyses were focused on characterization of emulsions from which films were casted and physical properties including thickness, water vapor permeability and microstructure of dried films. The antimicrobial properties against different Gram-positive and Gram-negative bacteria were also studied. Results showed that prepared emulsions exhibited good stability, while films had excellent barrier properties accompanied with antimicrobial activity.