DEVELOPMENT AND CHARACTERIZATION OF FILM-FORMING SOLUTIONS AND EDIBLE FILMS FROM BIODEGRADABLE RESIDUES

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Food industry residues represent a rich source of biopolymers and functional compounds. Therefore it could be used as a novel film-forming material for making edible films and coatings. The feasibility of using fruit and vegetable residue (FVR), obtained from an isotonic juice production, as a new film-forming material was studied. The rheological behavior, pH, total solid and soluble solid contents of film-forming solutions (FFS) were analyzed. FFS contained 8% and 10% (w/w) FVR, added or not of 5% and 10% potato skin (P) and 1% corn oil (O) and were prepared by stirring (70°C, 45 min), centrifugation (4000 rpm, 10 min) and filtration. The pH value of the different FFS was 4.0. In general, the results showed a progressive and significant (P<0.05) increase of the total solid contents, ranging from 3.49%±0.13 to 6.16%±0.18, and of soluble solid contents (°Brix), ranging from 4.076±0 to 5.539±0.078. In both analyses, the addition of 10%P+1%O into 8% or 10%FRV formulations was significantly different from that with only FRV. The mechanical spectra at 25°C (10% strain deformation) showed that the loss modulus G" (ω) values were higher than the storage modulus G’ (ω) values, over the frequency window used, which reveals the predominantly liquid-like character of all samples. Steady-shear flow tests showed a slight shear thinning behavior only for the highest concentrations of FFS (10%FVR+10%P+1%O, 10%FVR+5%P+1%O). Dried films presented a homogenous aspect, bright yellow color and pronounced fruit flavor. This study demonstrated the feasibility of using a multicomposite and biodegradable material to produce edible films.