

Effect of plasticizer type and concentration on physical properties of biodegradable films based on sugar palm (*arenga pinnata*) starch for food packaging

ABSTRACT

In this study, sugar palm starch (SPS) films were developed using glycerol (G), sorbitol (S) or their combination (GS) as plasticizers at the ratio of 15, 30 and 45 (wt)% using casting technique. The addition of plasticizers to SPS film-forming solutions helped to overcome the brittle and fragile nature of unplasticized SPS films. Increased plasticizer concentration resulted to an increase in film thickness, moisture content and solubility. On the contrary, density and water absorption of plasticized films decreased with increasing plasticizer concentration. Raising the plasticizer content from 15 to 45 % showed less effect on the moisture content and water absorption of S-plasticized films. Films containing glycerol and glycerol-sorbitol plasticizer (G, and GS) demonstrated higher moisture content, solubility and water absorption capacity compared to S-plasticized films. The results obtained in this study showed that plasticizer type and concentration significantly improves film properties and enhances their suitability for food packaging applications.

Keyword: Sugar palm; Starch; Biodegradable films; Plasticizer; Glycerol; Sorbitol