

The development of banana peel/corn starch bioplastic film: a preliminary study

ABSTRACT

The aim of this study is to develop bioplastic film from a combination of two biopolymers of same source, namely banana peel and corn starch. Five banana peel films (BP film) were prepared with different concentrations of corn starch (1% up to 5%) as co-biopolymer and film without corn starch acted as a control. The films were carried out with several durability tests and characterization analyses. Based on the results obtained, the BP film with 4% corn starch gave the highest tensile strength 34.72 N/m² compared to other samples. The water absorption test showed that BP films with 3% corn starch were resistant to water uptake by absorbing water up to 60.65%. In terms of characterization, spectra of Fourier Transform Infrared Spectroscopy (FTIR) obtained for BP control film and BP film with 4% corn starch were comparable with most of the peaks were present. The thermal analysis by differential scanning calorimetric (DSC) detected the melting temperature for both BP control film and BP film with 4% corn respectively at Tonset of 54.41°C and 67.83°C. Overall, combination of starches from two different sources can be used as an alternative in producing bioplastics.

Keyword: Bioplastic film; Banana peel; Corn starch; FTIR