

## **Storage stability of soy protein isolate films incorporated with mango kernel extract at different temperature**

### **ABSTRACT**

This research investigated the storage stability of antioxidant films made from waste and by-products which are soy protein isolate (SPI) and mango kernel extract (MKE) stored at room temperature (25 °C), refrigeration temperature (4 °C) and frozen temperature (−18 °C) for 90 days. The thickness of the films was maintained from 0.050 to 0.058 mm until the 90th day. The colour properties of SPI films incorporated with MKE (SPI + MKE) were generally not significantly affected by time and temperature except for the b value. All the films turned darker over the storage time. There was no dominant factor between temperature and time for the mechanical properties; all the films showed an increase in tensile strength and Young's modulus, and a decrease in elongation. The antioxidant activity of the films was determined by the total phenolic content and radical scavenging activity of DPPH and ABTS. SPI + MKE film at 25 °C showed the highest antioxidant activity as compared to films stored at 4 °C and −18 °C in all the analyses, with the result being significant in DPPH and ABTS analyses. The film stored at 25 °C showed 26 to 50% higher ( $p > 0.05$ ) TPC than films stored at 4 °C and −18 °C, respectively and had the highest antioxidant activity (54%) in ABTS analysis ( $p < 0.05$ ). SPI + MKE film stored at 25 °C also showed only 1% depreciation of radical scavenging activity (RSA) throughout the storage time. The highest decrease (4%) in antioxidant activity was recorded for SPI + MKE film stored at −18 °C, although it was considered very low. This shows that the antioxidant activity of the films is stable for 90 days of storage.

**Keyword:** Mango kernel extract; Soy protein isolate; Storage stability; Active packaging; Antioxidant film