Active packaging of fish gelatin films with Morinda citrifolia oil

ABSTRACT

Active packaging is of interest in helping to prevent autoxidation process in foods. Morinda citrifolia contains a wide range of antioxidants such as ascorbic acid, terpenoids, and polyphenols. The purpose of this study was to determine the potential of Morinda citrifolia as a natural antioxidant in an active packaging film. Fish gelatin films incorporated with 1–3% of Morinda citrifolia oil (MO) were used to prepare antioxidant films. It was found that the incorporation of MO would not affect the thickness and solubility of gelatin films, independent of concentration. However, the solubility ranging from 13.4% to 13.8% might be considered low for these films. As for the mechanical properties, Young's modulus and elongation at break were not affected significantly by incorporation of 1–3% MO ($p>0.05$). As for the tensile strength, fish gelatin film incorporated with 1–3% MO showed a higher value than control ($p\leq0.05$). The opacity between the samples and control varied statistically with the highest value with films containing 3% oil ($p\leq0.05$). However, increasing the MO concentrations would decrease the water vapor permeability ($p>0.05$). DPPH (2,2-diphenyl-1-picrylhydrazyl) was used to determine the antioxidant activity and the result increased significantly ($p\leq0.05$) from 9% to 16% with the increase of oil concentration, suggesting MO incorporation in films as potential means of active packaging.

Keyword: Active packaging; Gelatin; *Morinda citrifolia*; Antioxidant; Noni; Mengkudu