

Effect of different types and concentrations of emulsifier on the characteristics of kappa-carrageenan films

ABSTRACT

κ -Carrageenan films derived from *Euchema cottoni* containing different types and concentrations of emulsifier were developed. Film formation without the addition of emulsifier was used as a control. The physical, mechanical, optical and microstructural properties of these films were determined. Different types of emulsifiers (Tween 20, Tween 40 and Tween 80) exerted significant effects ($P \leq 0.05$) on the thickness, moisture content and opacity of the films. Additionally, Tween 20 and Tween 40 with concentrations from 0.1 to 0.5% (v/v) significantly ($P \leq 0.05$) improved the tensile strength of the films, ranging from 7.35 to 13.83 MPa. The water vapor permeability of the carrageenan films was significantly ($P \leq 0.05$) affected by both factors. Increasing the emulsifier concentration also caused an increment in the number of lipid droplets contributing to a smooth surface. Therefore, this study suggests that different types and concentrations of emulsifiers play essential roles in determining the physical properties of carrageenan films.

Keyword: Carrageenan; Emulsifier; Biodegradable films