

Investigation of properties of polysaccharide-based edible film incorporated with functional *Melastoma malabathricum* extract

ABSTRACT

Edible film can be used to replace the usage of non-biodegradable packaging material to reduce environmental pollution. In this study, three types of polysaccharide-based edible films including chitosan, sodium alginate and carboxymethyl cellulose (CMC) were made and compared for their physical, mechanical and chemical properties. Sodium alginate had the highest value of thickness (0.08 mm), elongation at break (42.70%) and puncture force (13.26 N). Sodium alginate having the most suitable properties, different concentrations of 0- 6% (v/v) of *Melastoma malabathricum* extract was incorporated into sodium alginate edible film and its physical, antioxidant and antimicrobial properties were determined. *Melastoma malabathricum* extract addition decreased the water activity and elongation at break of the film. The incorporation of *Melastoma malabathricum* extract did not significantly affect ($p>0.05$) the solubility, puncture force and the antimicrobial properties of sodium alginate edible film; while the antioxidant properties and the total phenolic content of the edible film improved. Thus, it showed that with the addition of *Melastoma malabathricum* extract into sodium alginate edible film, the functionality of the film as an active packaging was enhanced.

Keyword: Edible film; *Melastoma Malabathricum*; Antioxidant; Antimicrobial