

## ABSTRACT

The utilization of edible film has gained much attention in food packaging development and industry due to its potential to preserve food and biodegradability, which could reduce environmental waste compared to conventional food packaging. Moreover, the application of pure polymers has shown insufficient defense against microbial deterioration; thus, the incorporation of plant-derived secondary active compounds into the edible film has been extensively studied as a potential antimicrobial activity. In this study, a gelatin-chitosan composite incorporated with *Polygonum Minus Huds* (Kesum) extract was developed, and its antimicrobial, mechanical, and physical properties were evaluated. The antimicrobial activity of the KLE and gelatin-chitosan edible film with KLE extract showed that 2% of KLE has the highest antimicrobial activity on both *S. aureus* and *Salmonella* spp. The 2% of KLE film was evaluated for its physical, chemical, and microstructure. The result showed that the incorporation of 2% KLE significantly affects the mechanical and physical properties of the film. Adding 2% KLE significantly increased the thickness, water vapor permeability (WVP), and opacity of the film, while the film solubility (FS) decreased. For its mechanical properties, the elongation at break (EAB) and Tensile Strength (TS) showed significant decreases with the addition of KLE, while the Young Modulus (YM) is not significantly different compared to the control film. The SEM analysis showed that the adding 2% KLE resulted in a heterogeneous film with uneven granule distribution over the film's surface and crack or pore formed within the film, while the control film had a homogeneous film with a smooth surface. The presence of cracks and pores may be related to the loss of mechanical and physical properties of the film. Even though there are adverse effects on the mechanical and physical properties of the film, the 2% KLE film is still within the acceptable range to be used as food packaging.

**Keywords:** Gelatin-chitosan edible film, *Polygonum Minus Huds* extract, mechanical, physical, SEM, antimicrobial