

SUMMARY

Seaweed is abundant in Indonesian waters with coral reef substrates, but the utilization and processing of seaweed in Indonesia is still limited. The cell walls of seaweed primarily consist of lignocellulose. Its high cellulose content makes seaweed potentially valuable for various industries, notably in the production of biodegradable film material. The variables observed in this study were the seaweed species used and the quality of biodegradable films. This study was conducted using three different species of seaweed, namely *Sargassum* sp., *Gracilaria* sp., and *Ulva* sp. The objectives of this study were to determine the seaweed species with the highest cellulose content and to determine the quality of biodegradable films made from cellulose extracted from three seaweed species.

The analyzed parameters included the percentage of seaweed cellulose content and the biodegradable film's quality based on solubility, biodegradability, colour, odour, and texture. Cellulose was extracted from seaweed using a chemical extraction method. The film quality was evaluated through the solubility test, biodegradability test, and organoleptic test. Data analysis was performed using one-way analysis of variance (ANOVA, multiple groups) with a significance level of $\alpha=0.05$. The Kruskal-Wallis test was used if the data did not meet the assumption of a normal distribution.

The results showed that *Sargassum* sp. had the highest cellulose content at 49.65%. Based on the solubility test, the biodegradable film derived from *Gracilaria* sp. cellulose showed the highest solubility. Meanwhile, in terms of biodegradability, all three film samples showed good results with no significant differences observed among them. In the organoleptic test, the biodegradable film from *Sargassum* sp. cellulose had the lowest colour quality compared to *Ulva* sp. and *Gracilaria* sp. cellulose. However, for odour and texture, the three film samples showed no significant differences. Specifically, the odour of the three biodegradable films was faint, and the texture showed moderate surface smoothness, moderate durability, and moderate homogeneity.

Keywords: *biodegradable film, cellulose, extraction, quality, seaweed.*