

***CelBow-Plastics: Sintesis Bioplastik Alami Berbasis Selulosa Kulit Bawang Merah (*Allium cepa* L.) dan Alginat Rumput Laut Coklat (*Sargassum* sp.) untuk Aplikasi Berkelanjutan***

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**ABSTRACT**

The issue of conventional plastic waste that is difficult to decompose has driven the development of more environmentally friendly bioplastics based on natural materials. This study aims to synthesize bioplastics from shallot peel cellulose (*Allium cepa* L.) and brown seaweed alginate (*Sargassum* sp.) and to analyze the effect of composition variations on the physical properties of bioplastics, including thickness, water absorption, and biodegradability rate. Bioplastics were produced using the solvent casting method with glycerol as a plasticizer. The cellulose content was varied at 0.6 g (CI), 1 g (CII), and 1.4 g (CIII), while the alginate mass was kept constant at 3 g. The results showed that increasing the cellulose content enhanced the thickness of the bioplastic, with average values of 0.023 mm, 0.036 mm, and 0.046 mm, respectively. The water absorption test indicated that all samples completely degraded in water within 42–48 minutes. The biodegradability test revealed that sample CII degraded entirely (100%), while CI and CIII degraded by 44.44% and 83.33%, respectively. These findings suggest that bioplastics based on cellulose and alginate have the potential to serve as an eco-friendly alternative to Low-Density Polyethylene (LDPE), which is difficult to decompose. With high biodegradability and water absorption capacity, these bioplastics degrade more quickly in natural environments, contributing to the reduction of conventional plastic waste and promoting environmental sustainability.

**Keywords:** alginate, biodegradability, bioplastic, cellulose, water absorption