

## ABSTRACT

The aim of this research was to study the production of bioplastic from cellulose extracted from pomelo peel that is agricultural waste for reducing commercial plastic problem. Also, the cellulose was mixed with starch as base component and glycerol as plasticizer. There were 5 ratios of starch to cellulose; 10:0, 9:1, 8:2, 7:3, and 6:4. Each ratio was mixed with 0%, 10%, and 15% glycerol (v/w). In this experiment, moisture content of pomelo peel was 70.74% and cellulose was 10.98%. The ratio 9:1 without glycerol showed less moisture content that was 6.82%. The ratio 10:0 without glycerol showed lowest water, plant oil, and animal oil uptake that were 82.59%, 20.95%, and 32.59%, respectively. All of ratio of bioplastic were completely degraded in 45 days, except ratio 7:3 with 0%, 10%, 15% glycerol, and ratio 6:4 with 15% glycerol. All of ratio with 10% glycerol were more tensile strength force but less elasticity distance than 15% glycerol. For color analysis, 10:0 with 0%, 10%, and 15% glycerol were the most brightness, 6:4 with 10% and 15% glycerol were the most red color, and 9:1 with 15% glycerol was the most yellow color. All ratios of bioplastic have water holding capacity 1200  $\mu\text{L}$  also plant and animal oil holding capacity were 1000  $\mu\text{L}$  in 1 month. The ratio 7:3 showed the least thickness that was 0.54 mm. As this experiment was in the laboratory, for further study; other tests should be performed e.g. folding, melting point, SEM, etc.

**Keyword:** bioplastic, cellulose, moisture content, degradation, tensile strength