

**FABRIKASI DAN KARAKTERISASI TABLEWARE BIODEGRADABLE
DARI ONGGOK AREN (*Arenga pinnata*) DENGAN PEREKAT PATI
SINGKONG (*Manihot utilissima*)**

Lestari Lumban Gaol¹⁾, Wahyu Supartono²⁾, Dyah Ismoyowati²⁾

INTISARI

Konsumsi makan dan minuman diluar rumah semakin meningkat sebagai perubahan kebiasaan kerja dan rekreasi yang mengakibatkan peningkatan kuantitas dan kualitas limbah peralatan makan dan kemasan sekali pakai dari plastik yang tidak dapat terurai secara alami. Salah satu solusi upaya pengurangan limbah plastik dapat dilakukan dengan penggunaan alternatif lain yang ramah lingkungan seperti *tableware biodegradable*. *Tableware biodegradable* dapat diartikan sebagai peralatan makan yang dapat terurai atau hancur selama alami. *Tableware biodegradable* dapat dibuat dari bahan alami seperti onggok aren yang merupakan limbah pengolahan pati aren sebagai *filler* dengan bantuan pati singkong sebagai matriks untuk pengikat atau perekat. Penelitian ini dilakukan untuk mengetahui karakteristik *tableware biodegradable* dari onggok aren dan pati singkong berupa keteguhan lentur, kadar air, daya serap air, dan biodegradabilitas serta untuk mengetahui pengaruh konsentrasi pati singkong terhadap karakteristik *tableware biodegradable* yang dibuat.

Fabrikasi *tableware biodegradable* dilakukan menggunakan Rancangan Acak Lengkap (RAL) dan menggunakan analisis statistik ANOVA Satu Arah. Kombinasi konsentrasi onggok aren dan pati singkong yang digunakan yaitu variasi sampel A (80:20), B (70:30), C (60:40), dan D (50:50). *Tableware biodegradable* yang akan dicetak berbentuk nampan berukuran 20 cm x 15 cm dengan tambahan bagian sisi panjang sebesar 20 cm x 2 cm, dan bagian sisi lebar sebesar 15 cm x 2 cm dengan target ketebalan 0,2 cm. Pencetakan dilakukan menggunakan mesin kempa panas dua tahapan penekanan yaitu penekanan pertama pada suhu 150°C dan tekanan $30 \pm 5 \text{ kg/cm}^2$ selama 5 menit dan penekanan kedua pada suhu 150°C dan $150 \pm 5 \text{ kg/cm}^2$ selama 20 menit.

Hasil penelitian menunjukkan bahwa karakteristik keteguhan lentur *tableware biodegradable* tertinggi dimiliki variasi sampel C sebesar 5,11 kgf/cm², karakteristik kadar air tertinggi dimiliki variasi sampel D sebesar 10,24 %, karakteristik daya serap air tertinggi untuk lama waktu perendaman 1 menit, 1 jam, dan 4 jam secara berturut-turut yaitu variasi sampel A sebesar 26,15 %, variasi sampel A sebesar 131,68 %, dan variasi sampel D sebesar 218,16 %, dan terakhir karakteristik biodegradabilitas tertinggi dimiliki variasi sampel A sebesar 17,49 %. Berdasarkan hasil uji statistik ANOVA satu arah, diketahui bahwa konsentrasi pati singkong berpengaruh terhadap karakteristik kadar air dan daya serap air 4 jam, dan tidak berpengaruh terhadap karakteristik keteguhan lentur dan biodegradabilitas *tableware biodegradable*.

Kata kunci : *tableware biodegradable*, fabrikasi, karakterisasi, onggok aren, pati singkong

¹⁾ Mahasiswa Departemen Teknologi Industri Pertanian, Universitas Gadjah Mada

²⁾ Pengajar Departemen Teknologi Industri Pertanian, Universitas Gadjah Mada

FABRICATION AND CHARACTERIZATION OF BIODEGRADABLE TABLEWARE FROM ARENGA PALM (*Arenga pinnata*) WITH CASSAVA STARCH (*Manihot utilissima*) ADHESIVE

Lestari Lumban Gaol¹⁾, Wahyu Supartono²⁾, Dyah Ismoyowati²⁾

ABSTRACT

Consumption of eating and drinking outside the home is increasing as a change in work and recreational habits results in an increase in the quantity and quality of tableware and packaging waste from plastic that cannot be decomposed naturally. One of the solutions for reducing plastic waste can be done by using other environmentally friendly alternatives such as biodegradable tableware. Biodegradable tableware can be defined as tableware that can be decomposed or destroyed naturally. Biodegradable tableware can be made from natural materials such as arenga palm waste which is a waste of arenga palm starch production as filler with the help of cassava starch as the matrix for binders or adhesives. This study was conducted to determine the characteristics of biodegradable tableware from arenga palm and cassava starch in the form of modulus of rupture, moisture content, water absorption, and biodegradability and also to determine the effect of increasing cassava starch concentration on the characteristics of the biodegradable tableware.

The fabrication of biodegradable tableware was carried out using a Completely Randomized Design (CRD) and statistical analysis using one-way ANOVA. The combinations of the concentration of arenga palm waste and cassava starch used were namely variations in samples A (80:20), B (70:30), C (60:40), and D (50:50). The biodegradable tableware to be molded was in the form of a tray with a specific dimension of 20 cm x 15 cm with an additional length of 20 cm x 2 cm, and a width of 15 cm x 2 cm with a target thickness of 0.2 cm. The molding was carried out using a hot press machine with two stages of pressing, the first pressing at a temperature 150°C and a pressure of 30 ± 5 kg/cm² for 5 minutes and the second pressing at a temperature of 150°C and 150 ± 5 kg/cm² for 20 minutes.

The results showed that the characteristics of the highest modulus of rupture of biodegradable tableware were found in the variation of sample C at 5.11 kgf/cm², the highest water content characteristics in the variation of sample D at 10.24%, and the highest water absorption characteristics for 1 minute, 1 hour, and 4 hours of immersion were found in the variation of sample A at 26.15%, variation sample A at 131.68%, and variation of sample D at 218.16 %, and finally the highest biodegradability characteristic was found in the variation of A at 17.49%. Based on the *one-way* ANOVA showed that cassava starch concentration had an effect on the characteristics of water content and water absorption for 4 hours, and had no effect on the characteristics of modulus of rupture and biodegradability of the biodegradable tableware.

Keywords : biodegradable tableware, fabrication, characterization, arenga palm waste, cassava starch

¹⁾ Student of Department of Agro-industrial Technology, Universitas Gadjah Mada

²⁾ Lecturer of Department of Agro-industrial Technology, Universitas Gadjah Mada