

DEVELOPMENT OF CELLULOSE BASED PACKAGING MATERIAL FROM COFFEE PULP AND IMPROVEMENT OF ITS ANTIOXIDANT CAPACITY

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ABSTRACT

A biodegradable packaging film was developed by substituting methylcellulose obtained from coffee pulp which offer favorable environmental advantages of recyclability and reutilization compared to conventional petroleum-based synthetic polymers. The films developed was optimized on the basis of thickness and tensile properties. With increase of ratio of substitution of natural methylcellulose with coffee pulp methylcellulose, thickness of the developed packaging material was decreasing. Significant difference in the thickness was observed when natural cellulose was substituted above 5% and below 20% with coffee pulp methylcellulose. Increasing concentration of coffee pulp methylcellulose resulted in decreased mechanical property, both tensile strength (TS) and elongation (%E). TS of 15% substituted ratio (42.81 N/m²) was found to be similar to control polypropylene (PP) films (42.83 N/m²) sample whereas there was a significant difference between %E of control with minimum substituted values. The optimized solution includes 85.19% of natural cellulose and 14.81% coffee pulp methyl cellulose for developing the film. Addition of 18.5g of antioxidants (extracted from coffee pulp) in the developed films resulted in more retention of Vitamin E Acetate (993.811 mg/l) compared to other samples thereby indicating a decrease in oxygen transmission rate.

KEYWORDS: Coffee Pulp, Biodegradable Films, Thickness, Tensile Characteristics, Antioxidant Capacity

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