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Research article

CHARACTERISTICS OF EDIBLE FILM BASED ON WATER HYACINTH (*Eichornia crassipes*) AS FOOD PACKAGING INNOVATION

Martina Widhi Hapsari[1]✉, Ratih Paramastuti[2], Lusiawati Dewi[1], Lina Rohana[1], Rhema Alicia[1], Amelia Griselda[1], Heni Rizqiati[2], Siti Susanti[2]

[1]Department of Food Technology, Science and Technology Faculty, Universitas Nasional Karangturi, Semarang, Indonesia

[2]Department of Food Technology, Faculty of Animal and Agricultural Sciences, Universitas Diponegoro, Semarang, Indonesia

✉Corresponding author: Martina Widhi Hapsari, Food Technology Department, Faculty of Science and

✉Corresponding Author: E-mail: martina.widhi@unkartur.ac.id

ORCID Number :0009-0001-2078-7029

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Abstract

This study explores the potential of water hyacinth (*Eichhornia crassipes*) cellulose in developing edible films as a sustainable alternative for food packaging. Edible films are biodegradable and eco-friendly materials that minimize plastic waste while maintaining food safety and quality. Water hyacinth, an invasive aquatic plant with a cellulose content of approximately 62.15%, offers a promising source for bioplastic production. This research investigates the effects of varying concentrations of hyacinth cellulose (3%, 4%, and 5%) and glycerol (1% and 1.5%) on edible films' physical and chemical properties, with carrageenan as a structural agent. Results indicate that higher cellulose concentrations increase tensile strength and reduce water absorption, while higher glycerol concentrations enhance flexibility and increase water absorption and thickness. The optimal combination of glycerol, carrageenan, and cellulose in the edible film formulation is necessary to balance flexibility, mechanical strength, water absorption, and the desired moisture content. Based on the film thickness, tensile strength, water absorption, and moisture content test, the best edible film is 5% hyacinth cellulose and 1.5% glycerol.