

## INTISARI

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*Edible films* merupakan kemasan ramah lingkungan yang dapat dibuat dari biopolymer seperti protein, polisakarida, dan lipid. Porang (*Amorphophallus oncophyllus*) adalah tanaman umbi-umbian lokal Indonesia yang mengandung glukomanan tinggi dan berpotensi untuk pembuatan *edible film*. Namun, glukomanan mengandung hidrokoloid yang kurang baik sehingga perlu ditambahkan *plasticizer* sorbitol. Tujuan penelitian ini adalah optimasi formula *edible film* glukomanan dengan penambahan sorbitol menggunakan metode *central composite design* (CCD) berdasarkan nilai kuat tarik. *Edible film* formula optimum dilakukan karakterisasi warna, ketebalan, kuat tarik, pemanjangan, kadar air, *swelling property*, kelarutan, permeabilitas uap air, dan SEM. Hasil penelitian menunjukkan bahwa formula optimum *edible film* adalah konsentrasi glukomanan sebesar 0,90% (w/v) dan konsentrasi sorbitol sebesar 15,43% (w/w). Karakterisasi *edible film* memperoleh nilai warna, yaitu  $L^*=90,1$ ,  $a^*=-3,23$ , dan  $b^*=9,82$ , ketebalan sebesar 0,005 mm, kuat tarik = 384,48 mPa, pemanjangan (%) = 18,02, kadar air (%) = 0,014, *swelling property* (%) = 4,31, kelarutan (%) = 4,29, permeabilitas uap air ( $\text{g.H}_2\text{O.m}^{-1}.\text{Pa}^{-1}$ ) ( $10^{-11}$ ) = 1,04. Hasil SEM menunjukkan permukaan film yang kurang halus karena glukomanan yang belum larut sempurna. Penelitian ini menunjukkan *edible film* berbasis glukomanan dengan *plasticizer* sorbitol dapat diaplikasikan pada pengemasan produk pangan dengan nilai  $a_w$  yang rendah.

Kata kunci : *Amorphophallus oncophyllus*, *edible film*, glukomanan, sorbitol, *central composite design*

**OPTIMIZATION AND CHARACTERIZATION OF EDIBLE FILM  
OPTIMUM FORMULA BASED ON GLUCOMANNAN PORANG  
(*Amorphophallus oncophyllus*) AND PLASTICIZER SORBITOL USING  
RESPONSE SURFACE METHODOLOGY**

**ABSTRACT**

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Edible films are eco-friendly packaging that can be made from biopolymers such as proteins, polysaccharides, and lipids. Porang (*Amorphophallus oncophyllus*) is a local Indonesian tuber plant that contains high glucomannan and has the potential as edible films. Unfortunately, glucomannan contains poor hydrocolloids so it is necessary to add a plasticizer to enhance its physical/chemical properties, such as sorbitol. The purpose of this study was to optimize the glucomannan edible films with the addition of sorbitol using the central composite design (CCD) method based on the tensile strength value. The optimum edible film formula was characterized its color, thickness, tensile strength, elongation, moisture content, swelling property, solubility, water vapor permeability, and SEM. The results of the study indicated that the optimum edible film formula was a glucomannan concentration of 0,90% (w/v) and a sorbitol concentration of 15,43% (w/w). Characterization of the edible film obtained color  $L^*=90,10$ ,  $a^*=-3,23$ , and  $b^*=9,82$ , thickness = 0,005 mm, tensile strength = 384,48 mPa, elongation (%) = 18,02, moisture content (%) = 0,014, swelling property (%) = 4,31, solubility (%) = 4,29, water vapor permeability ( $\text{g.H}_2\text{O.m}^{-1}.\text{Pa}^{-1}$ ) ( $10^{-11}$ ) = 1,04. The SEM results showed that the film surface was less smooth because the glucomannan had not completely dissolved. This study suggested that glucomannan edible film with the addition sorbitol can be applied to the packaging of food products with low  $a_w$  values.

Keywords: *Amorphophallus oncophyllus*, edible film, glucomannan, sorbitol, central composite design



**OPTIMASI DAN KARAKTERISASI FORMULA OPTIMUM EDIBLE FILM BERBASIS GLUKOMANAN  
PORANG (*Amorphophallus  
oncophyllus*) DAN PLASTICIZER SORBITOL DENGAN RESPONSE SURFACE METHODOLOGY**  
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