

KARAKTERISASI PATI BERPORI DARI GANYONG (*Canna edulis* Kerr.) HASIL HIDROLISIS ENZIM GLUKOAMILASE

INTISARI

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Umbi ganyong (*Canna edulis* Kerr.) memiliki kadar pati yang tinggi (93,30%) sehingga berpotensi sebagai sumber pati. Pati alami yang dimodifikasi menjadi berpori (*porous starch*) dapat memperluas aplikasi dalam bidang pangan maupun non-pangan. Penelitian ini bertujuan untuk menghasilkan dan melakukan karakterisasi pati berpori dari ganyong dengan hidrolisis enzim glukoamilase. Konsentrasi glukoamilase yang berbeda-beda dievaluasi untuk mendapatkan karakteristik pati ganyong berpori yang dikehendaki. Suspensi pati ganyong dihidrolisis menggunakan glukoamilase pada konsentrasi 25, 50, 75 U/g selama 8 jam pada suhu 60°C, kemudian dikeringkan selama 48 jam pada suhu 40°C. Pati berpori dilakukan analisis *swelling power*, *solubility*, absorpsi air, absorpsi minyak, adsorpsi metilen biru, kadar amilosa, kadar air, rendemen, *scanning electron microscopy* (SEM), *x-ray diffraction* (XRD), *fourier transform infrared spectroscopy* (FT-IR) dan warna. Pati ganyong berpori pada konsentrasi glukoamilase 75 U/g menunjukkan nilai tertinggi untuk kapasitas absorpsi air (96,69%) dan kapasitas absorpsi minyak (59,74%). Kapasitas adsorpsi metilen biru tertinggi sebesar 36,47% diperoleh pada konsentrasi glukoamilase 50 U/g. Pati ganyong berpori mengalami penurunan kadar amilosa, kadar air dan rendemen dibandingkan dengan kontrol. Namun, untuk *solubility* dan *swelling power* tidak berbeda nyata terhadap kontrol. Pati ganyong berpori memiliki diameter pori kecil dengan rongga dalam. Hidrolisis enzimatis tidak mempengaruhi tipe kristal dan struktur kimia molekul pati, tetapi terjadi penurunan nilai derajat putih. Dengan demikian, karakteristik fungsional pati ganyong dapat dimodifikasi menggunakan konsentrasi glukoamilase yang sesuai.

Kata kunci : pati berpori, ganyong, enzim glukoamilase, hidrolisis enzimatis

CHARACTERIZATION OF POROUS STARCH FROM GANYONG (*Canna edulis* Kerr.) AFTER HYDROLYSIS BY GLUCOAMYLASE ENZYME

ABSTARCT

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Canna tuber has a high starch content (93,30%), making it a potential source of starch. Natural starch modified into porous starch can expand applications in the food and non-food industries. This study aimed to produce and characterize porous starch from canna by the hydrolysis of the glucoamylase enzyme. The different concentrations of the glucoamylase were evaluated to obtain the desired characteristics of canna porous starch. Canna starch suspension was hydrolyzed using glucoamylase at a concentration of 25, 50, 75 U/g for 8 h at 60°C, and then dried for 48 h at 40°C. The porous starch was analyzed for swelling power, solubility, water absorption, oil absorption, methylene blue adsorption, amylose content, water content, yield, scanning electron microscopy (SEM), x-ray diffraction (XRD), fourier transform infrared spectroscopy (FT-IR) and color test. Canna porous starch at glucoamylase concentration of 75 U/g showed the highest water absorption capacity (96,69%) and oil absorption capacity (59,74%). The highest methylene blue adsorption of 36,47% was obtained by 50 U/g glucoamylase concentration. Canna porous starch resulted in decreasing amylose content, moisture content, and yield compare to control. Whereas, its solubility and swelling power were not significantly different than the control. Canna porous starch displayed small pore diameters with deep cavities. Enzymatic hydrolysis did not affect the crystal type and molecular chemical structure of starch but decreased the degree of whiteness. Thus, it is possible to modify the functional characteristics of canna starch using a suitable glucoamylase concentration.

Keywords : porous starch, ganyong, glucoamylase enzyme, hydrolysis enzymatic