

Intisari

Biji salak banyak mengandung komponen kimia seperti pektin, lignin, hemiselulosa dan selulosa serta beberapa komponen yang lain. Selulosa sangat berpotensi untuk diolah menjadi senyawa turunannya seperti *Carboxy Methyl Cellulose* (CMC) yang dapat digunakan sebagai bahan tambahan pangan. Tujuan penelitian ini adalah (1) ekstraksi dan karakterisasi selulosa biji salak, (2) mengetahui kondisi optimum sintesis CMC dari biji salak pondoh yang memiliki kualifikasi DS *food grade* dengan variasi konsentrasi NaOH, banyaknya NaMCA, dan suhu reaksi dengan metode *Response Surface Methodology* (RSM), (3) mengetahui karakteristik CMC dengan DS *food grade* dari selulosa biji salak yang dihasilkan.

Penelitian ini diawali dengan cara melakukan analisa kandungan selulosa dari tepung biji salak Pondoh Super dan biji salak Pondoh Hitam. Biji salak dengan kandungan selulosa paling tinggi digunakan sebagai bahan baku ekstraksi selulosa. Ekstraksi selulosa dari tepung biji salak terpilih dilakukan dengan menggunakan larutan NaOH dengan konsentrasi 4, 8, 12, 16 atau 20%. Bubuk selulosa kemudian dilakukan analisa yang meliputi kadar abu, kadar selulosa, WHC, *lightness*, gugus fungsi kristanilitas dan rendemen. Bubuk selulosa dengan kadar selulosa yang paling tinggi kemudian digunakan sebagai bahan dasar untuk sintesis CMC. Proses optimasi sintesis CMC menggunakan metode RSM (*response surface method*) dengan variabel tetap yang diamati berupa derajat substitusi (DS) dan variabel bebas meliputi konsentrasi NaOH, banyaknya NaMCA, dan suhu reaksi. CMC yang telah dilakukan optimasi kemudian dilakukan karakterisasi meliputi kadar air, viskositas, kristanilitas, kemurnian, WHC, OHC, *lightness*, gugus fungsi dan rendemen.

Hasil penelitian menunjukkan bahwa ekstraksi selulosa dari biji salak Pondoh Super menggunakan NaOH dengan konsentrasi 4% terpilih dengan karakteristik sebagai berikut: kadar selulosa 64,16 (%db), kadar abu 1,80 (%db), *lightness* 89,21, WHC 3,07 g/g, kristanilitas 28,80% dan rendemen 29,67 (%db). Kondisi optimasi untuk sintesis CMC menggunakan konsentrasi NaOH 15,59 % (w/v), NaMCA 5,02 g dengan suhu 50°C. CMC yang dihasilkan memiliki karakteristik sebagai berikut: DS 0,76, kemurnian 90,86%, kadar air 7,16 (%wb), viskositas 4,76 cps, WHC 3,73 (g/g), OHC 2,31 (g/g), *lightness* 78,49, kristanilitas 25,00% dan rendemen 169,14%

Kata kunci : Biji salak Pondoh, CMC, DS, selulosa, sintesis

Abstract

Snake fruit kernel contains many chemical components such as pectin, lignin, hemicellulose, cellulose and some other components. Cellulose has the potential source to be processed into its derivatives such as Carboxy Methyl Cellulose (CMC) that can be used as food additives. The purpose of this study were (1) extraction and characterization of cellulose from snake fruit kernel, (2) determine the optimum condition of the synthesis of CMC from snake fruit pondoh kernel which is has qualification of degree of substitution (DS) as food grade by varying of NaOH concentration, natrium monochloroacetat (NaMCA) level and reaction temperature by using Response Surface Methodology (RSM), (3) determine the characteristics of CMC which is has qualification of degree of substitution (DS) as food grade produced from snake fruit pondoh kernel.

The research was carried out with the analyze of snake fruit kernel powder from Pondoh Super” and “Pondoh Hitam”. Pondoh Super kernel have highest cellulose content was selected as a raw material. Extraction of cellulose from snake fruit kernel powder using NaOH solution with a concentration of 4, 8, 12, 16 or 20%. Cellulose powder were then analyzed for ash content, cellulose content, WHC, lightness, functional groups, crystallinity ad yield. Cellulose powder produced with the highest cellulose content then used as main material for synthesis of CMC. Synthesis of CMC was optimized using RSM (response surface method) with the fixed variable observed response were degree of substitution and the independent variables such as the concentration of NaOH, level of NaMCA, and reaction temperature. CMC that has been optimized further then analyzed by several parameters such as water content, viscosity, cristallinity, purity, WHC, OHC, lightness, functional groups ad yield.

The result shown that cellulose powder extracted using 4 % NaOH has been chosen and has characteristic such as cellulose content 64.16(%db), ash content of 1.80 (%db), lightness 89.21, WHC 3.07 g/g, 28.80% cristanillity and yield 29.67 (%db). Optimum condition for synthesis of CMC obtained with 15.59 % (w/v) NaOH concentration, 5.02 g NaMCA level, and reaction temperature 50⁰C. CMC that has been optimized has characteristics such as DS 0.76, purity 90.86 %, moisture content 7.16 (%wb), viscosity of 4.76 cps, WHC 3.73 (g/g), OHC 2.31 (g/g), lightness 78.49, cristanillity 25.00% and yield 169.14%.

Keywords : Snake fruit Pondoh kernel, CMC, DS ,cellulose, synthesis