PENGARUH PENGGUNAAN ETANOL REDISTILASI UNTUK EKSTRAKSI GLUKOMANAN DARI TEPUNG PORANG (*Amorphophallus oncophyllus*) TERHADAP KARAKTER FISIKOKIMIA TEPUNG GLUKOMANAN

INTISARI

Oleh:
WINALDHA AISYALHANI DAMAR PUTRI
18/425426/TP/12127

Glukomanan merupakan polisakarida yang memiliki sifat hidrokoloid yang baik sehingga banyak dimanfaatkan dalam industri pangan. Glukomanan dapat diperoleh dari umbi porang yang diolah menjadi tepung porang terlebih dahulu. Proses ektraksi ini membutuhkan dan menyisakan etanol dalam jumlah banyak sehingga mendorong penggunaan etanol redistilasi. Tujuan penelitian ini, yaitu menganalisis karakteristik etanol redistilasi yang dihasilkan dan perbedaanya dengan etanol baru, pengaruh penggunaan etanol redistilasi terhadap karakteristik rendemen dan fisikokimia tepung glukomanan dan perbedaannya dengan penggunaan etanol baru, serta biaya bahan dalam proses ekstraksi. Tahapan ekstraksi glukomanan dilakukan melalui pelarutan tepung porang dalam air dilanjutkan ekstraksi menggunakan etanol untuk memisahkan glukomanan dari air. Variasi penggunaan etanol yang digunakan, yaitu etanol baru (96,0 ± 0,0%; pH = 7,79 ± 0,07), etanol redistilasi I (87,5 ± 1,3%; pH = 6,32 ± 0,30), dan etanol redistilasi 2 (85,7 ± 1,5%; pH = 6,30 ± 0,16). Etanol redistilasi 1 adalah hasi distilasi sisa etanol baru yang telah digunakan pada proses ekstraksi glukomanan. Etanol redistilasi 2 adalah hasil distilasi sisa etanol redistilasi 1 yang telah digunakan pada proses ekstraksi glukomanan. Kualitas tepung glukomanan yang diukur, yaitu karakteristik rendemen dan fisikokimia tepung glukomanan.

Penggunaan etanol baru menghasilkan produk tepung glukomanan dengan kadar air 7,1866 ± 0,7830%; kadar glukomanan 47,5662 ± 2,0773%; kadar protein 2,2987 ± 0,1930%; kadar abu 0,5665 ± 0,0365%; kadar lemak 0,0604 ± 0,0066%, pH 5,67 ± 0,21; rendemen 75,8106 ± 3,2001%; derajat *whiteness* 75,18 ± 0,89; viskositas 11.133 ± 517 cp; transparansi 33,2 ± 0,7%; kelarutan 93,2113 ± 1,4855%; WHC 50,9084 ± 3,0474 g air/g tepung. Penggunaan etanol redistilasi 1 menghasilkan produk tepung glukomanan dengan kadar air 8,4196 ± 0,2839%; kadar glukomanan 47,3851 ± 0,4191%; kadar protein 2,2922 ± 0,0858%; kadar abu 0,5769 ± 0,0167%; kadar lemak 0,0988 ± 0,0101%, pH 5,66 ± 0,27; rendemen 72,0200 ± 3,1200%; derajat *whiteness* 74,56 ± 0,38; viskositas 10.906 ± 658 cp; transparansi 31,0 ± 1,0%; kelarutan 92,0449 ± 0,9077%; WHC 48,7297 ± 2,3111 g air/g tepung. Penggunaan etanol redistilasi 2 menghasilkan produk tepung glukomanan dengan kadar air 8,8712 ± 0,0818%; kadar glukomanan 45,9894 ± 0,3392%; kadar protein 2,2221 ± 0,0674%; kadar abu 0,5816 ± 0,0242%; kadar lemak 0,1371 ± 0,0407%; pH 5,55 ± 0,10; rendemen 71,2971 ± 0,4565%; derajat *whiteness* 74,22 ± 0,70; viskositas 10.742 ± 550 cp; transparansi 29,8 ± 0,6%; kelarutan 90,4095 ± 0,5248%; WHC 47,8131 ± 0,9152 g air/g tepung. Hasil

penelitian menunjukkan bahwa variasi penggunaan etanol redistilasi berpengaruh nyata terhadap kadar air, kadar glukomanan, kadar lemak, dan hampir semua karakteristik fisik tepung glukomanan, kecuali rendemen. Berdasarkan analisis biaya yang dilakukan, penggunaan etanol redistilasi dapat menghemat biaya bahan sebesar Rp1.660.024–Rp1.816.208 untuk setiap produksi 1 kg tepung glukomanan

Kata kunci: etanol redistilasi, glukomanan, fisikokimia, tepung porang, rendemen.

EFFECT OF USING RE-DISTILLED ETHANOL FOR GLUCOMANNAN EXTRACTION PROCESS FROM PORANG FLOUR (*Amorphophallus oncophyllus*) ON THE PHYSICOCHEMICAL CHARACTERISTICS OF GLUCOMANNAN

ABSTRACT

By:
WINALDHA AISYALHANI DAMAR PUTRI
18/425426/TP/12127

Glucomannan is a hydrocolloid polysaccharide and is widely used in the food industry. Glucomannan can be obtained from porang tuber which is processed into porang flour first. The extraction process requires and remains numerous ethanol, thus encouraging the use of re-distilled ethanol. This study aimed to analyse the characteristics of re-distilled ethanol and its difference from fresh ethanol, the effect of using re-distilled ethanol on the yield and physicochemical characteristics of glucomannan flour and its difference with the use of fresh ethanol, amd materials cost in the extraction process. The extraction process was carried out by dissolving porang flour in water followed by extraction using ethanol to separate glucomannan from water. Variations of ethanol used are fresh ethanol (96,0 ± 0,0%; pH = 7,79 ± 0,07), first re-distilled ethanol (87,50 ± 1,3%; pH = 6,32 ± 0,30), and second re-distilled ethanol (85,7 ± 1,5%; pH = 6,30 ± 0,16). First re-distilled ethanol is a distillate from the distillation of fresh ethanol which has been used in the extraction process. Second re-distilled ethanol is a distillate from the distillation of first re-distilled ethanol which has been used in the extraction process. The quality of glucomannan flour was determined by measuring the yield and physicochemical characteristics.

The resultant glucomannan from fresh ethanol had moisture content of 7,1866 ± 0,7830%; glucomannan content of 47,5662 ± 2,0773%; protein content of 2,2987 ± 0,1930%; ash content of 0,5665 ± 0,0365%; fat content of 0,0604 ± 0,0066%, pH of 5,67 ± 0,21; yield of 75,8106 ± 3,2001%; whiteness degree of 75,18 ± 0,89; viscosity of 11.133 ± 517 cp; transparency of 33,2 ± 0,7%; solubility of 93,2113 ± 1,4855%; WHC 50,9084 ± 3,0474 g water/g flour. The resultant glucomannan from first re-distilled ethanol had quality moisture content of 8,4196 ± 0,2839%; glucomannan content of 47,3851 ± 0,4191%; protein content of 2,2922 ± 0,0858%; ash content of 0,5769 ± 0,0167%; fat content of 0,0988 ± 0,0101%, pH of 5,66 ± 0,27; yield of 72,0200 ± 3,1200%; whiteness degree of 74,56 ± 0,38; viscosity of 10.906 ± 658 cp; transparency of 31,0 ± 1,0%; solubility of 92,0449 ± 0,9077%; WHC 48,7297 ± 2,3111 g water/g flour. The resultant glucomannan from second re-distilled ethanol had quality moisture content of 8,8712 ± 0,0818%; glucomannan content of 45,9894 ± 0,3392%; protein content of 2,2221 ± 0,0674%; ash content of 0,5816 ± 0,0242%; fat content of 0,1371 ± 0,0407%, pH of 5,55 ± 0,10; yield of 71,2971 ± 0,4565%; whiteness degree of 74,22 ± 0,70; viscosity of 10.742 ± 550 cp; transparency of 29,8 ± 0,6%; solubility of 90,4095 ± 0,5248%; WHC 47,8131 ± 0,9152 g water/g flour. The result showed that the variation in the

use of re-distilled ethanol significantly affected the moisture content, glucomannan content, fat content, and all physical characteristic of glucomannan flour, except for yield. Based on the cost analysis, the use of re-distilled ethanol can save material costs of Rp1,660,024–Rp1,816,208 per kilogram of glucomannan production.

Keyword: re-distilled ethanol, glucomannan, physicochemical, porang flour, yield.