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KINETIKA EKSTRAKSI DAN KARAKTERISASI GLUKOMANAN DARI VARIASI TEPUNG PORANG (*Amorphophallus oncophyllus*) YANG DIPROSES DENGAN PERLAKUAN PENYOSOHAN DISERTAI PENCUCIAN ETANOL

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INTISARI

Porang (*Amorphophallus oncophyllus*) merupakan umbi-umbian sebagai bahan baku pembuatan glukomanan yang dimanfaatkan oleh industri. Kecepatan keluarnya glukomanan pada proses ekstraksi dipengaruhi oleh kualitas tepung porang berdasarkan proses pembuatan dan peralatan yang digunakan. Penelitian bertujuan menganalisis ekstraksi dan mengkarakterisasi glukomanan dari tepung porang yang diproses dengan perlakuan penyosohan disertai pencucian etanol. Tahapan ekstraksi glukomanan yang dilakukan, meliputi pelarutan glukomanan dari tepung porang dalam air (ekstraksi tahap pertama), penyaringan filtrat, presipitasi filtrat dengan etanol (ekstraksi tahap kedua), pengeringan, penggilingan, dan pengayakan. Perubahan viskositas pada ekstraksi tahap pertama diukur setiap 3 menit selama 1 jam. Perubahan volume selama penyaringan diukur setiap 1 menit, sedangkan perubahan massa *cloud* selama proses ekstraksi tahap kedua diukur setiap 10 detik. Perubahan viskositas bubur porang, volume filtrat, dan massa *cloud* dianalisis menggunakan persamaan kinetika Avrami. Hasil ekstraksi berupa glukomanan dikarakterisasi kualitas fisik dan kimia dengan parameter kadar air, pH, viskositas, kelarutan, transparansi, warna, rendemen, kadar glukomanan, dan kadar kalsium oksalat. Pengaruh kualitas tepung glukomanan dari tepung porang yang diproses dari perlakuan penyosohan disertai pencucian etanol dilakukan analisis statistik. Pemilihan metode pembuatan tepung porang terbaik didasarkan pada kualitas tepung glukomanan yang diperoleh.

Hasil penelitian menunjukkan ekstraksi glukomanan dari tepung porang yang bervariasi menghasilkan perubahan viskositas pada ekstraksi tahap pertama 22×10^{-7} – 11×10^{-2} mPa.s/menit, perubahan volume filtrat 0,00645–0,03038 ml/menit, dan perubahan massa *cloud* pada ekstraksi tahap kedua 0,2548–0,0283 g/detik. Hasil karakterisasi sifat fisik tepung glukomanan dari berbagai variasi tepung porang untuk kadar air 4,42–8,88%wb, pH 6,62–6,88, viskositas 10000–28000 mPa.s, transparansi 8,9–42,57%, warna 54,77–69,1%, dan rendemen 53–63,67%. Sedangkan, hasil karakterisasi sifat kimia tepung glukomanan adalah kadar glukomanan 63,87–92,77% dan kadar kalsium oksalat 0,0144–0,0198%. Kualitas tepung glukomanan yang diperoleh, sebagian besar memenuhi standar China dan Eropa. Kualitas tepung glukomanan terbaik diperoleh dari tepung porang yang diproses dengan perlakuan menggunakan *disk mill*, satu kali penyosohan, dan pencucian dengan etanol murni. Hasil analisis statistik menunjukkan adanya pengaruh perlakuan penggilingan, penyosohan, dan pencucian etanol pada pembuatan tepung porang terhadap kualitas tepung glukomanan yang meliputi viskositas, kelarutan, warna, transparansi, rendemen, dan kadar glukomanan.

Kata kunci: ekstraksi, fisikokimia, etanol, glukomanan, porang

EXTRACTION KINETICS AND CHARACTERIZATION OF GLUCOMANNAN FROM VARIATIONS OF PORANG FLOUR (*Amorphophallus oncophyllus*) PROCESSED BY POLISHING TREATMENT WITH ETHANOL LEACHING

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ABSTRACT

Porang (*Amorphophallus oncophyllus*) is a tuber as a raw material for making glucomannan which is used by industry. The speed of glucomannan release during the extraction process is influenced by the quality of the porang flour based on the production process and equipment used. The research aims to analyze the extraction and characterize glucomannan from porang flour processed by polishing treatment accompanied by ethanol leaching. The glucomannan extraction stages carried out include dissolving glucomannan from porang flour in water (first stage extraction), filtering the filtrate, filtrate precipitation with ethanol (second stage extraction), drying, grinding, and sieving. Viscosity changes in the first stage of extraction were measured every 3 minutes for 1 hour. Volume changes during filtration were measured every 1 minute, while changes in cloud mass during the second stage of the extraction process were measured every 10 seconds. Changes in porang porridge viscosity, filtrate volume, and cloud mass are explained using the Avrami kinetic equation. The extraction results in the form of glucomannan are characterized by physical and chemical quality with the parameters water content, pH, viscosity, solubility, transparency, color, yield, glucomannan content, and calcium oxalate content. The influence of the quality of glucomannan flour from porang flour which was processed from the polishing treatment accompanied by ethanol leaching was carried out statistical analysis. The selection of the best method for making porang flour is based on the quality of the glucomannan flour obtained.

The results of the research showed that the extraction of glucomannan from various porang flour resulted in a change in viscosity in the first stage of 22×10^{-7} – 11×10^{-2} mPa.s/minute, a change in filtrate volume of 0.00645–0.03038 ml/minute, and a change in mass cloud in the second stage of extraction 0.2548–0.0283 g/sec. Results of characterization of physical properties of glucomannan flour from various variations of porang flour for water content 4.42–8.88% wb, pH 6.62–6.88, viscosity 10000–28000 mPa.s, transparency 8.9–42.57%, color 54.77–69.1%, and yield 53–63.67%. Meanwhile, the results of characterization of the chemical properties of glucomannan flour were glucomannan levels of 63.87–92.77% and calcium oxalate levels of 0.0144–0.0198%. The quality of the glucomannan flour obtained mostly meets Chinese and European standards. The best quality glucomannan flour is obtained from porang flour which is processed using a disk mill, once polishing, and leaching with pure ethanol. The results of statistical analysis show that there is an influence of milling, polishing and ethanol washing treatments in making porang flour on the quality of glucomannan flour which includes viscosity, solubility, color, transparency, yield and glucomannan content.

Key words: extraction, physicochemistry, ethanol, glucomannan, porang