

Kajian Mutu Produk Glukomanan Komersial di Indonesia

Quality Assessment of Commercial Glucomannan Products in Indonesia

Dr. Titik Budiati, S.TP., M.T., M.Sc., dan Enny Sholichah, S.Si., M.Sc.

Nayaka Putra Prasetya Utomo

Study Program of Food Engineering Technology

Majoring of Agriculture Technology

Program Studi Teknologi Rekayasa Pangan

Jurusan Teknologi Pertanian

ABSTRAK

Umbi porang (*Amorphophallus muelleri* Blume) merupakan salah satu sumber glukomanan. Glukomanan merupakan hidrokoloid dengan sifat *gelling* yang dimanfaatkan dalam berbagai industri. Tujuan penelitian ini untuk mengetahui kadar glukomanan dan karakteristik produk glukomanan komersial dari empat daerah di Indonesia seperti, Semarang (GK1), Surabaya (GK2), Bandung (GK3), dan Sleman-Yogyakarta (GK4). Karakterisasi glukomanan mencakup sifat fisik, komposisi kimia, reologi, morfologi dan molekuler serta hasil terbaik ditinjau berdasarkan *feasibility study*. Hasil penelitian ini menunjukkan sampel glukomanan GK1 memiliki nilai *whiteness index* tertinggi (80,97%) dan *swelling capacity* (31,08 g/mL). Adapun *solubility* tertinggi dimiliki oleh sampel GK2 (95,93%). Sampel GK1 memiliki komposisi kimia yang memenuhi standar mutu yaitu kadar glukomanan (82,15%), kadar air (10,72%), kadar abu (1,56%), kadar pati (0,80%), dan kadar protein (0,89%). Kandungan (Ca) oksalat tertinggi pada GK3 sebesar (1,14 ppm). Sementara, kandungan kalsium (Ca) tertinggi pada GK4 sebesar (4,19 ppm). Logam berat (Pb) tidak terdeteksi pada sampel GK1 dan GK2, namun pada sampel GK 1 mengandung 0,016 ppm dan GK3 0,019 ppm. Profil reologi semua sampel menunjukkan perilaku *shear-thinning* dengan viskositas tertinggi pada GK1 (18,466 cP). Morfologi sample GK4 menunjukkan adanya kristal kalsium oksalat. Distribusi berat molekul sampel glukomanan GK2 memiliki nilai M_w ($5,9 \times 10^5$), nilai (M_n) tertinggi pada GK1 sebesar ($4,43 \times 10^5$) dan PDI (M_w/M_n) ($4,43 \times 10^5$). Spektra FTIR semua sampel identik dengan spektra glukomanan. *Feasibility study* menunjukkan GK1 layak dikembangkan dengan NPV positif, B/C rasio >1, dan *payback period* 0,178 tahun. Variasi karakteristik antar sampel glukomanan dapat dipengaruhi oleh kondisi geografis tanaman porang atau metode ekstraksi yang digunakan.

Kata kunci : *Amorphophallus muelleri* Blume, Glukomanan, Mutu, Tepung

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ABSTRACT

Porang (Amorphophallus muelleri Blume) tubers are one source of glucomannan. Glucomannan is a hydrocolloid with gelling properties that various industries. The purpose of this study was to determine the glucomannan content and characteristics of commercial glucomannan products from four regions in Indonesia. Semarang (GK1), Surabaya (GK2), Bandung (GK3), and Sleman-Yogyakarta (GK4). Glucomannan characterization physical properties, chemical composition, rheology, morphology, molecular and feasibility study. The results showed GK1 had the highest whiteness index (80.97%) and swelling capacity (31.08 g/mL). The highest solubility is GK2 (95.93%). GK1 has a chemical composition that meets quality standards, glucomannan (82.15%), moisture (10.72%), ash (1.56%), starch (0.80%), and protein (0.89%). The highest oxalate (Ca) in GK3 was (1.14 ppm). Meanwhile, the highest calcium (Ca) in GK4 was (4.19 ppm). Heavy metal (Pb) was not detected in GK1 and GK2, but in GK1 contained 0.016 ppm and GK3 0.019 ppm. The rheological profiles of all samples showed shear-thinning behavior with the highest viscosity in GK1 (18.466 cP). The morphology, GK4 showed the presence of calcium oxalate crystals. The molecular weight distribution of glucomannan sample GK2 had a Mw value of (5.9×10^5), the highest (Mn) value in GK1 of (4.43×10^5) and PDI (Mw/Mn) (4.43×10^5). The FTIR spectra of all samples were identical to the spectra of glucomannan. Feasibility study showed that GK1 is feasible to develop with positive NPV, B/C ratio >1, and payback period 0.178 years. Variations in characteristics between glucomannan samples may be influenced by the geographical conditions of the porang plant or the extraction method used.

Keywords: *Amorphophallus muelleri Blume, Flour, Glucomannan, Quality*