

ABSTRACT

STUDY ON THE PURIFICATION OF PORANG GLUCOMANNAN FLOUR (*Amorphophallus oncophyllus*)

By

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Porang tubers (*Amorphophallus oncophyllus*) are plants that contain glucomannan, which is beneficial in the fields of food and health. The purification of glucomannan flour can be done in three ways: chemically, enzymatically, and mechanically, to achieve optimal glucomannan content > 90% and low oxalate calcium content. The aim of this study is to determine the effect of alcohol concentration and acidity level (pH) on the yield, glucomannan content, and calcium oxalate content of porang glucomannan flour and to determine the interaction of alcohol concentration and acidity level (pH) on the yield, glucomannan content, and calcium oxalate content of porang glucomannan flour. The research was arranged factorially in a Completely Randomized Block Design (RAKL) with 3 replications. The first factor is the addition of alcohol concentration (G) which consists of 5 levels, namely 45% (G₁), 55% (G₂), 65% (G₃), 75% (G₄), 85% (G₅). The second factor is the acidity level (pH) (F) which consists of 4 levels, namely 3 (F₁), 4 (F₂), 5 (F₃), 6 (F₄). This study consists of the process of extracting glucomannan mechanically with a hammer mill and disc mill, testing the crude glucomannan yield, glucomannan content, and calcium oxalate content to obtain the best treatment, which is then tested physically and chemically. The results showed that alcohol concentration and acidity level (pH) affected the yield (80,51–96,05), glucomannan content (80,50–96,49), and calcium oxalate content (0,059–0,187). Alcohol concentration of 85% and pH 5 (G₅F₃) produced the best glucomannan flour with a yield of 80,51%, glucomannan content of 96,49%, calcium oxalate of 0,059%, viscosity of 18200 cP, moisture content of 13%, ash content of 3,34%, protein content of 3,5%, loss on drying (LOD) of 7,5%, water binding capacity of 138%, chloride content of 0,02%, lead content of 1,31 ppm, starch content of 9,36%, fiber content of 1,2%, solubility in alcohol of 0,9%, and solubility in ether of 0,2%.

Keywords: Alcohol, glucomannan, calcium oxalate, porang

ABSTRAK

KAJIAN PEMURNIAN TEPUNG GLUKOMANAN PORANG (*Amorphophallus oncophyllus*)

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Umbi porang (*Amorphophallus oncophyllus*) merupakan tanaman yang mempunyai kandungan glukomanan yang bermanfaat dalam bidang pangan dan kesehatan. Pemurnian tepung glukomanan dapat dilakukan dengan tiga cara, yaitu secara kimia, enzimatis, dan mekanis untuk mencapai kadar glukomanan optimal > 90% dan kadar kalsium oksalat rendah. Tujuan dari penelitian ini adalah untuk menentukan pengaruh konsentrasi alkohol dan tingkat keasaman (pH) terhadap rendemen, kadar glukomanan, dan kadar kalsium oksalat tepung glukomanan porang serta menentukan interaksi konsentrasi alkohol dan tingkat keasaman (pH) terhadap rendemen, kadar glukomanan, dan kalsium oksalat tepung glukomanan porang terbaik. Penelitian disusun secara faktorial dalam Rancangan Acak Kelompok Lengkap (RAKL) dengan 3 kali ulangan. Faktor pertama adalah penambahan konsentrasi alkohol (G) yang terdiri dari 5 taraf, yaitu 45% (G₁), 55% (G₂), 65% (G₃), 75% (G₄), 85% (G₅). Faktor kedua adalah derajat keasaman (pH) (F) yang terdiri dari 4 taraf, yaitu 3 (F₁), 4 (F₂), 5 (F₃), 6 (F₄). Penelitian ini terdiri atas proses ekstraksi glukomanan secara mekanis dengan *hammer mill* dan *disc mill*, pengujian rendemen glukomanan kasar, kadar glukomanan, kadar kalsium oksalat untuk mendapatkan perlakuan terbaik, yang kemudian diuji secara fisik dan kimia. Hasil penelitian menunjukkan konsentrasi alkohol dan tingkat keasaman (pH) berpengaruh terhadap rendemen (80,51–96,05), kadar glukomanan (80,50–96,49) dan kadar kalsium oksalat (0,059–0,187). Konsentrasi alkohol 85% dan pH 5 (G₅F₃) menghasilkan tepung glukomanan terbaik dengan rendemen 80,51%, kadar glukomanan 96,49%, kalsium oksalat 0,059%, viskositas 18200 cP, kadar air 13%, kadar abu 3,34%, kadar protein 3,5%, *Loss on drying* (LOD) 7,5%, daya ikat air 138%, kadar klorida 0,02%, kadar timbal 1,31 ppm, kadar pati 9,36%, kadar serat 1,2%, kelarutan dalam alkohol 0,9%, dan kelarutan dalam eter 0,2%.

Kata Kunci : Alkohol, glukomanan, kalsium oksalat, porang