

ABSTRACT

MECHANICAL STUDY OF PORANG GLUCOMANNAN FLOUR (*Amorphophallus oncophyllus*) PRODUCTION PROCESS

By

SILATURAHMI WIDAPUTRI

Porang tuber (*Amorphophallus oncophyllus*) contains a potential compound in the form of glucomannan which can be extracted physically, chemically, and mechanically. Extraction in this study was carried out mechanically with a disc mill and blower. The aims of this study were to determine the effect of porang flour particle size on yield, glucomannan content, and calcium oxalate content of glucomannan flour, to determine the effect of blower air speed on yield, glucomannan content, and calcium oxalate content of glucomannan flour, and to determine the interaction of porang flour particle size and the speed of blower air for the best yield, glucomannan content, and calcium oxalate content of glucomannan flour. The study was arranged factorially in a Complete Randomized Block Design (RAKL) with 3 repetitions. The first factor in the treatment was particle size (mesh) consisting of 3 levels, namely M1 (40 mesh); M2 (60 mesh); and M3 (80 mesh); and the second factor in the treatment was blower air speed (m/s) consisting of 3 levels, namely K1 (5 m/s); K2 (7.5 m/s); K3 (10 m/s). This research consisted of mechanical glucomannan extraction process with disc mill and blower, testing crude glucomannan yield, glucomannan content, calcium oxalate content to get the best treatment, which were then tested physically and chemically. The data obtained were analyzed statistically using the Bartlett and Tuckey tests and then continued with the ANOVA test and LSD test at the 5% level. The results showed that the best treatment interaction, namely M3K3 with a particle size of 80 mesh and a blower air speed of 10 m/s with the test results being yield 52.90%, glucomannan content 94.45%, calcium oxalate content 0.06%, moisture content 9.64%, ash content 2.80%, protein content 0.88%, Loss on Drying 6.2% , water holding capacity 595.66%, viscosity 48000 cP, chloride content 0.02%, lead content 0.21%, starch content 0.95%, crude fiber 1.44%, pH 6.9, solubility in alcohol 0.17%, and solubility in ether 0.22%.

Keywords: *glucomannan, disc mill, blower, mesh, calcium oxalate*

ABSTRAK

KAJIAN PROSES PEMBUATAN TEPUNG GLUKOMANAN PORANG (*Amorphophallus oncophyllus*) SECARA MEKANIS

Oleh

SILATURAHMI WIDAPUTRI

Umbi porang (*Amorphophallus oncophyllus*) mengandung senyawa potensial berupa glukomanan yang dapat diekstraksi secara fisik, kimia, dan mekanis. Ekstraksi pada penelitian ini dilakukan secara mekanis dengan *disc mill* dan hembusan *blower*. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh ukuran partikel tepung porang terhadap rendemen, kadar glukomanan, dan kadar kalsium oksalat tepung glukomanan, mengetahui pengaruh kecepatan udara *blower* terhadap rendemen, kadar glukomanan, dan kadar kalsium oksalat tepung glukomanan, dan mengetahui interaksi ukuran partikel tepung porang dan kecepatan udara *blower* terhadap rendemen, kadar glukomanan, dan kadar kalsium oksalat tepung glukomanan terbaik. Penelitian disusun secara faktorial dalam Rancangan Acak Kelompok Lengkap (RAKL) dengan 3 ulangan. Faktor pertama pada perlakuan adalah ukuran partikel terdiri atas 3 taraf yaitu M1 (40 mesh); M2 (60 mesh); dan M3 (80 mesh); serta faktor kedua pada perlakuan adalah kecepatan udara *blower* terdiri atas 3 taraf yaitu K1 (5 m/s); K2 (7,5 m/s); K3 (10 m/s). Penelitian ini terdiri atas proses ekstraksi glukomanan secara mekanis dengan *disc mill* dan hembusan *blower*, pengujian rendemen glukomanan kasar, kadar glukomanan, kadar kalsium oksalat untuk mendapatkan perlakuan terbaik, kemudian diuji secara fisik dan kimia. Data yang dianalisis secara statistik menggunakan uji Bartlett dan Tuckey dilanjutkan dengan uji ANOVA dan uji BNT pada taraf 5%. Hasil penelitian menunjukkan interaksi perlakuan terbaik yaitu M3K3 dengan ukuran partikel 80 mesh dan kecepatan udara *blower* sebesar 10 m/s dengan hasil pengujian rendemen sebesar 52,90%, kadar glukomanan 94,45%, kadar kalsium oksalat 0,06%, kadar air 9,64%, kadar abu 2,80%, kadar protein 0,88%, *Loss on Drying* 6,2%, daya ikat air 595,66%, viskositas 48000 cP, kadar klorida 0,02%, kadar timbal 0,21%, kadar pati 0,95%, serat kasar 1,44%, pH 6,9, kelarutan dalam alkohol 0,17%, dan kelarutan dalam eter 0,22%.

Kata kunci: glukomanan, *disc mill*, hembusan *blower*, mesh, kalsium oksalat