

KARAKTERISASI FISIK GLUKOMANAN PORANG (*Amorphophallus oncophyllus*) YANG DIPURIFIKASI DENGAN PERLAKUAN FILTRASI DAN TANPA FILTRASI BUBUR PORANG

INTISARI

Oleh:

MUHAMMAD KAMARUL HAMZAN

19/446865/TP/12668

Porang (*Amorphophallus oncophyllus*) merupakan komoditas umbi yang memiliki nilai ekonomi karena dikenal sebagai sumber serat dengan kadar glukomanan yang tinggi. Untuk memperoleh manfaatnya, porang memerlukan proses pengolahan dan pemurnian lebih lanjut menjadi tepung glukomanan. Pemurnian glukomanan dilakukan dengan memflokulasi senyawa *impurities* pada bubur porang, difiltrasi, dipresipitasi dengan etanol, dikeringkan, digiling, lalu diayak menghasilkan tepung glukomanan. Namun, tahapan filtrasi menyebabkan proses produksi memakan waktu lama dan menghasilkan rendemen yang rendah. Pada penelitian ini akan dilakukan karakterisasi tepung glukomanan yang dimurnikan tanpa perlakuan filtrasi bubur porang. Selain itu, upaya hilirisasi hasil riset glukomanan ke skala industri memerlukan adanya penelitian mengenai karakterisasi fisik glukomanan yang dihasilkan sehingga menjadi bahan evaluasi untuk pengembangan lini produksi glukomanan skala industri. Penelitian ini menggunakan rancangan acak lengkap non-faktorial dengan perlakuan pemurnian glukomanan dengan filtrasi sebagai kontrol dan pemurnian glukomanan tanpa filtrasi bubur porang dengan variasi skala laboratorium dan skala *pilot-plant*. Pada skala laboratorium, glukomanan dengan filtrasi menghasilkan rendemen 75,18%, derajat putih 79,11, transparansi 47,96%, kelarutan 94,21%, WHC 56,15 g air/g GMP, viskositas 13.583 cps, dan pH 5,41. Glukomanan tanpa filtrasi menghasilkan rendemen 77,74%, derajat putih 78,52, transparansi 39,35%, kelarutan 85,91%, WHC 55,48 g air/g GMP, viskositas 13,292 cps, dan pH 5,18. Pada skala *pilot-plant*, glukomanan dengan filtrasi menghasilkan rendemen 66,41%, derajat putih 73,57, transparansi 38,62%, kelarutan 93,21%, WHC 57,61 g air/g GMP, viskositas 5.267 cps, dan pH 5,24. Glukomanan tanpa filtrasi menghasilkan rendemen 73,24%, derajat putih 73,25, transparansi 29,15%, kelarutan 77,01%, WHC 53,13 g air/g GMP, viskositas 4.725 cps, dan pH 5,05. Glukomanan yang dimurnikan tanpa filtrasi menghasilkan rendemen tertinggi namun dengan karakteristik fisik yang cenderung rendah sehingga perlakuan terbaik didapatkan pada glukomanan yang dimurnikan dengan filtrasi. Glukomanan produksi skala *pilot-plant* memiliki rendemen dan derajat putih, transparansi, dan viskositas yang lebih rendah dibandingkan glukomanan produksi skala laboratorium. Pengembangan lebih lanjut diperlukan sebagai upaya menyempurnakan proses pemurnian glukomanan pada skala *pilot-plant* sehingga meningkatkan mutu tepung glukomanan yang dihasilkan.

Kata kunci: glukomanan, pemurnian, bubur porang, filtrasi, *pilot-plant*

PHYSICAL CHARACTERIZATION OF PORANG (*Amorphophallus oncophyllus*) GLUCOMANNAN PURIFIED WITH FILTRATION AND NON-FILTRATION TREATMENT OF PORANG PORRIDGE

ABSTRACT

By:

MUHAMMAD KAMARUL HAMZAN

19/446865/TP/12668

Porang (*Amorphophallus oncophyllus*) is a tuber commodity that has economic value because it is known as a source of fiber with high levels of glucomannan. Porang requires further processing and purification into glucomannan flour so that it can be widely applied. Glucomannan purification is carried out by flocculating impurities in porang porridge, then filtrating, precipitating with ethanol, drying, grinding, then sifting to produce glucomannan flour. However, the filtration stage causes the production process to take a long time and results in a low yield. In this research, glucomannan flour will be characterized, which is purified without the porang porridge filtration process. In order to translate glucomannan lab-scale production to an industrial-scale, it requires study on the physical characteristics of the glucomannan produced. This research used a non-factorial, completely randomized design with treatment of glucomannan produced from porang porridge with filtration step as a control and glucomannan produced without filtration step with two variations, namely laboratory scale and pilot-plant scale. On a laboratory scale, glucomannan with filtration produces a yield of 75.18%, whiteness of 79.11, and transparency of 47.96%. Solubility of 94.21%, WHC 56.15 g water/g GMP, viscosity 13,583 cps, and pH 5.41. Glucomannan without filtration produced a yield of 77.74%, whiteness of 78.52, transparency of 39.35%, solubility of 85.91%, WHC of 55.48 g water/g GMP, viscosity of 13,292 cps, and pH of 5.18. On a pilot-plant scale, glucomannan with filtration produced a yield of 66.41%, whiteness of 73.57, and transparency of 38.62%. Solubility of 93.21%, WHC 57.61 g water/g GMP, viscosity of 5,267 cps, and pH of 5.24. Glucomannan without filtration produced a yield of 73.24%, whiteness of 73.25, transparency of 29.15%, solubility of 77.01%, WHC of 53.13 g water/g GMP, viscosity of 4,725 cps, and pH of 5.05. Glucomannan that is purified without filtration produces the highest yield, but with physical characteristics that tend to be low, so the best treatment is obtained from glucomannan that is purified by filtration. Pilot-plant scale production of glucomannan has a lower yield and physical characteristics of whiteness, transparency, and viscosity than laboratory-scale production of glucomannan. Further development is required to enhance glucomannan refining process on a pilot-plant scale to improve the quality of glucomannan flour produced.

Key words: glucomannan, purification, porang porridge, filtration, pilot-plant