

**APLIKASI GLUKOMANAN PORANG (*Amorphophallus oncophyllus*)
SEBAGAI BAHAN COATING DAN PENGARUHNYA TERHADAP
KUALITAS FISIK SERTA UMUR SIMPAN SORGUM
(*Sorghum bicolor* L. Moench)**

INTISARI

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Biji sorgum merupakan sumber karbohidrat sebagai alternatif pengganti beras dengan kandungan antioksidan dan asam lemak yang tinggi. Namun, keberadaan lemak berpotensi menimbulkan ketengikan karena terjadi oksidasi. Selain itu, tekstur biji sorgum juga pera ketika ditanak sehingga kurang diminati. Oleh karena itu, perlu diupayakan perbaikan kualitas fisik biji sorgum supaya umur simpannya lebih lama dan lebih pulen ketika dikonsumsi dengan cara pemberian *coating* menggunakan glukomanan. Penelitian ini bertujuan untuk mengaplikasikan glukomanan porang sebagai bahan *coating* dan menganalisis pengaruh *coating* terhadap kualitas fisik serta umur simpan.

Bahan *coating* yang digunakan adalah glukomanan porang dan glukomanan konjac dengan variasi konsentrasi 0,1%; 0,2%; 0,3%; 0,4% (w/v) dan kontrol (tanpa *coating*). Sudut kontak antara larutan *coating* dengan permukaan sorgum diukur menggunakan mikroskop *portable*. Sampel sorgum dicelupkan dalam larutan *coating* kemudian ditiriskan dan dikeringkan menggunakan *Cabinet Dryer*. Selanjutnya, sorgum dikemas vakum dalam plastik polipropilen ketebalan 0,03 mm dan disimpan pada suhu kamar ($\pm 25^{\circ}\text{C}$) selama 49 hari. Selama penyimpanan dilakukan pengukuran perubahan kualitas fisik (kadar air, massa jenis, tekstur, warna dan susut bobot), kerusakan fisik (butir pecah) dan kandungan amilosa. Data perubahan kualitas fisik dianalisis untuk menentukan konstanta laju perubahan kualitas fisik dan menentukan umur simpan sorgum yang dilapisi larutan *coating*. Pada penelitian ini dilakukan penentuan umur simpan menggunakan metode kinetika, persamaan dalam model ASLT (*Accelerated Shelf Life Testing*) dan persamaan yang didasarkan pada keseimbangan massa.

Berdasarkan hasil penelitian diperoleh konstanta laju peningkatan butir pecah sorgum selama penyimpanan pada berbagai konsentrasi larutan *coating* adalah 0,0097 – 0,0106 % /hari untuk glukomanan porang, 0,0054 – 0,014 % /hari untuk glukomanan konjac, sedangkan 0,0115 % /hari untuk kontrol. Laju kerusakan biji sorgum pecah dengan perlakuan *coating* menggunakan glukomanan porang lebih lambat dibandingkan dengan sorgum perlakuan glukomanan konjac dan kontrol. Berdasarkan analisis penentuan umur simpan ternyata metode yang lebih mendekati hasil observasi adalah metode penentuan umur simpan berdasarkan keseimbangan massa. Sorgum dengan pelapisan glukomanan porang memiliki umur simpan yang lebih lama 8 – 69 hari dibandingkan sorgum dengan pelapisan glukomanan konjac dan 13 – 86 hari dibandingkan sorgum perlakuan kontrol.

Kata kunci : *coating*, glukomanan, kualitas fisik, sorgum, umur simpan

APPLICATION OF GLUCOMANNAN PORANG (*Amorphophallus oncophyllus*) AS A COATING MATERIAL AND THE EFFECT ON PHYSICAL QUALITY AND SHELF LIFE OF SORGHUM (*Sorghum bicolor L. Moench*)

ABSTRACT

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Sorghum seeds are a source of carbohydrates that can be used as an alternative to rice, which are high in antioxidants and fatty acids. However, the fat content of sorghum has the potential to cause rancidity due to oxidation. In addition, the texture of sorghum seeds is also dry when cooked, so it is less desirable. Therefore, it is necessary to improve the physical quality of sorghum seeds so that they have a longer shelf life and fluffier when consumed by coating them with glucomannan. This study aims to apply glucomannan porang as a coating material and analyze the effect of coating on physical quality and shelf life.

The coating materials used were porang glucomannan and konjac glucomannan with a concentration variation of 0.1%; 0.2%; 0.3%; 0.4% (w / v) and control (without coating). The contact angle between the coating solution and the sorghum surface was measured using a portable microscope. The sorghum sample was immersed in a coating solution then drained and dried using a Cabinet Dryer. Furthermore, sorghum was vacuum packed in polypropylene plastic with a thickness of 0.03 mm and stored at room temperature (± 25 ° C) for 49 days. During storage, changes in physical quality (moisture content, density, texture, color and weight loss) were measured, physical damage (broken grains) and amylose content. Data on changes in physical quality were analyzed to determine the rate constants for changes in physical quality and to determine the shelf life of sorghum coated with a coating solution. In this study, the determination of shelf life using kinetics methods, equations in the ASLT (Accelerated Shelf Life Testing) model and equations based on mass balance were determined.

Based on the results of the study, the constant rate of increase in the broken grain of sorghum during storage at various concentrations of coating solution was 0.0097 - 0.0106% / day for glucomannan porang, 0.0054 - 0.014% / day for konjac glucomannan, while 0.0115% / day. days for control. The rate of breakage of broken sorghum seeds with coating treatment using glucomannan porang was slower than sorghum with konjac glucomannan treatment and control. Based on the analysis of the shelf life determination, it turns out that the method that is closer to the observation results is the method of determining the shelf life based on mass balance. Sorghum with glucomannan porang coating has a longer shelf life of 8 - 69 days compared to sorghum with konjac glucomannan coating and 13 - 86 days compared to sorghum treated with control.

Keywords: coating, glucomannan, physical quality, sorghum, shelf life