

## **PENGARUH JUMLAH GLISEROL DAN ASAM MALEAT PADA PENGOLAHAN TURUNAN GONDORUKEM DENGAN TEKNIK GLISEROL ESTER MALEAT**

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### **INTISARI**

Hasil hutan non-kayu mempunyai banyak jenis produk yang memiliki nilai dan potensi tinggi untuk terus dikembangkan. Salah satu produk hasil hutan non kayu tersebut adalah gondorukem. Gondorukem merupakan pengolahan lebih lanjut dari hasil sadapan getah pohon pinus (*Pinus merkusii*). Gondorukem sangat mudah mengalami proses degradasi dan teroksidasi sehingga menyebabkan kualitasnya menurun. Penurunan kualitas dapat diatasi menggunakan metode modifikasi dengan teknik gliserol ester maleat.

Gondorukem modifikasi dilakukan melalui proses fortifikasi, esterifikasi, pencucian, dan penyulingan. Proses modifikasi gondorukem ini bertujuan untuk menghasilkan produk gondorukem yang stabil seperti ester gliserol gondorukem maleat. Tahapan awal dilakukan pengujian kualitas bahan baku seperti titik lunak, bilangan asam, kadar abu, kelarutan dalam toluena untuk pembuatan ester gliserol gondorukem maleat yang dilakukan secara duplo. Proses fortifikasi ini menggunakan asam maleat teknis (taraf 8%, 10%, dan 12%), kemudian masak kembali dengan penambahan gliserol secara esterifikasi (taraf 10%, 12%, dan 14%). Pengujian kualitas dilakukan kembali berdasarkan sifat fisiko-kimia derivat gondorukem.

Hasil penelitian menunjukkan bahwa peningkatan persentase asam maleat pada gliserol berpengaruh nyata terhadap kadar abu dan titik lunak ester gliserol gondorukem maleat. Pada pengujian kualitas lainnya tidak berpengaruh nyata pada produk ester gliserol gondorukem maleat yakni bilangan asam, kelarutan dalam toluena dan rendemen. Peningkatan presentase gliserol mempengaruhi ester gliserol gondorukem maleat dengan kadar abu dan bilangan asam semakin rendah serta titik lunak semakin tinggi, namun pada titik lunak nilai peningkatannya hanya sampai pada penambahan presentase gliserol 12%. Hasil penelitian ini menunjukkan bahwa produk ester gliserol gondorukem maleat memiliki peluang untuk dipertimbangkan dalam sektor industri sebagai pemasok bahan baku derivat gondorukem dunia.

Kata kunci : *gondorukem, gondorukem modifikasi, gliserol, asam maleat, fortifikasi, esterifikasi, ester gliserol gondorukem maleat*

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## **EFFECT OF TOTAL GLYCEROL AND MALEIC ACID ON THE PROCESSING OF GONDORUKEM DERIVATIVES USING GLYCEROL MALEIC ESTER TECHNIQUE**

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### **ABSTRACT**

Non-timber forest products have many types of products that have high value and potential to be more developed. One of the non-timber forest products is Gondorukem. Gondorukem is further processing of the tapping of pine tree sap (*Pinus merkusii*). Gondorukem is prone to degradation and oxidation process, leading into their quality decrease. The decrease in quality can be overcome using a modification method with the glycerol maleic ester technique.

Modified gondorukem is carried out through fortification, esterification, washing, and refining processes. This process is done in order to produce stable gondorukem derivatives such as glycerol ester of rosin maleic. The initial stage was testing the quality of raw materials such as soft point, acid number, ash content, and solubility in toluena for the manufacture of glycerol ester of rosin maleic which was carried out in duplicate. Then, this fortification process uses technical maleic acid (8%, 10%, and 12% level), later reprocessed with the addition of glycerol by esterification (10%, 12%, and 14% level). Testing the quality of the modified gondorukem based on its physical and chemical properties was tested in duplicate.

The results indicated that the increase of maleic acid percentage in glycerol had a significant effect on the ash content and the soft point of glycerol ester of maleic gondorukem. In other quality tests, there was no significant effect on the esterification product of maleic gondorukem namely acid number, solubility in toluena, and yield. The percentage increase of glycerol affects the glycerol ester of rosin maleic with lower ash content and acid number and higher soft point. However, at the soft point, the increase is only up to the glycerol percentage addition of 12%. The results of this study indicate that the esterified product of Gondorukem maleate has the opportunity to be considered in the industrial sector as a supplier of raw materials for the world's Gondorukem derivatives.

**Keyword:** *gondorukem, modified gondorukem, glycerol, maleic acid, fortification, esterification, glycerol ester of rosin maleic*

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