

## INTISARI

Siwalan atau lontar (*Borassus flabellifer* L.) merupakan salah satu tanaman yang banyak tumbuh di kawasan kering, seperti di Kabupaten Tuban, Jawa Timur. Siwalan diketahui mengandung kadar selulosa yang tinggi dengan persentase sebesar 68,94% sehingga berpotensi untuk digunakan sebagai bahan baku pembuatan mikrokrystalin selulosa (MCC). Pembuatan MCC penting untuk karena mengingat tingginya angka impor bahan baku obat Indonesia terutama produk selulosa dan turunannya yang mencapai 144.769.752 ton. Salah satu tahap yang berpengaruh terhadap kualitas MCC yang dihasilkan adalah hidrolisis. Penelitian ini bertujuan untuk mengetahui pengaruh perbedaan konsentrasi asam klorida (HCl) terhadap karakteristik MCC dan mengetahui konsentrasi HCl optimum dalam proses hidrolisis  $\alpha$ -selulosa. Hidrolisis dilakukan menggunakan HCl konsentrasi 0,5 N, 1,5 N, dan 2,5 N. Parameter keberhasilan dinilai melalui kadar lignoselulosa dengan metode *Chesson Datta*. Produk MCC kemudian dilakukan karakterisasi dengan Pharmacel® 101 sebagai pembandingan.

Hasil penelitian menunjukkan bahwa konsentrasi 2,5 N menghasilkan kadar selulosa tertinggi di antara konsentrasi lainnya yaitu sebesar 77,33% sehingga digunakan dalam produksi MCC yang kemudian dilakukan uji karakteristik. Berdasarkan hasil penelitian didapatkan rendemen  $\alpha$ -selulosa sebesar 25,55% terhadap serbuk siwalan, rendemen MCC sebesar 92,47% terhadap  $\alpha$ -selulosa. Didapatkan MCC berupa serbuk krem kecokelatan, tidak berasa, dan tidak berbau. MCC siwalan memiliki pH 6,43 dengan sifat fisik praktis tidak larut dalam air, HCl 2 N, NaOH 1 N, dan alkohol 95% dengan nilai susut pengeringan 3,66%, kadar air 7,03%, *bulk density* 0,479 g/mL, *tapped density* 0,587 g/mL, laju alir 5,539 g/s, dan sudut diam 25,83°. MCC siwalan juga dikarakterisasi menggunakan FTIR, SEM-EDX, dan XRD. Berdasarkan hasil penelitian, karakteristik MCC siwalan memiliki kemiripan dengan Pharmacel® 101.

**Kata Kunci:** Serabut Siwalan,  $\alpha$ -Selulosa, Hidrolisis, HCl, Mikrokrystalin Selulosa, Karakterisasi

## ABSTRACT

*Siwalan or lontar (*Borassus flabellifer* L.) is one of the plants that grows in dry areas, such as in Tuban Regency, East Java. Siwalan contains high cellulose, 68.94%, so that it has the potential to be used as a raw material for making microcrystalline cellulose (MCC). The manufacture of MCC is important because of the high import rate of Indonesian medicinal raw materials, especially cellulose products and their derivatives, which reached 144,769,752 tons. One of the stages that affects the quality of the MCC produced is hydrolysis. This study aims to determine the effect of differences in hydrochloric acid (HCl) concentrations on MCC characteristics and to determine the optimum HCl concentration in the  $\beta$ -cellulose hydrolysis process. Hydrolysis was carried out using HCl concentrations of 0.5 N, 1.5 N, and 2.5 N. The success parameters were assessed through lignocellulose content using the Chesson Datta method. MCC products were then characterized with Pharmacel® 101 as a comparison. The results showed that the concentration of 2.5 N produced the highest cellulose content among other concentrations, which was 77.33%, so it was used in the production of MCC which was then tested for characteristics.*

*Based on the results of the study, the yield of  $\alpha$ -cellulose was 25.55% against siwalan powder; the yield of MCC was 92.47% against  $\alpha$ -cellulose. MCC siwalan is a brownish cream powder, tasteless, and odorless. MCC siwalan has a pH of 6,43 practically insoluble in water; 2 N HCl, 1 N NaOH, and 95% alcohol with a loss on drying 3.66%, water content of 7.03%, bulk density of 0.479 g/mL, tapped density of 0.587 g/mL, flow rate of 5.539 g/s, and angle of repose of 25.83°. MCC siwalan was also characterized using FTIR, SEM-EDX, and XRD. Based on the research, the characteristics of siwalan MCC are similar to Pharmacel® 101.*

**Key Words:** *Palm Fiber,  $\alpha$ -Cellulose, Hydrolysis, HCl, Microcrystalline Cellulose, Characterization*