

## **PEMANFAATAN LIMBAH BATANG PISANG KEPOK (*Musa acuminata*) SEBAGAI BAHAN PEMBUATAN ARANG AKTIF**

**Oleh:**

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### **INTISARI**

Indonesia mempunyai 137 jenis pisang sebagai komoditas pangan. Pisang memberikan kontribusi paling besar terhadap produksi dan konsumsi buah-buahan nasional. Beberapa jenis pisang mempunyai nilai jual tinggi dan digemari masyarakat. Limbah batang pisang yang terjadi setiap pemanenan kurang dimanfaatkan selain sebagai pakan ternak dalam skala kecil.

Limbah batang pisang diteliti sebagai bahan baku penelitian. Penelitian menggunakan rancangan acak lengkap (*Completely Randomized Design*). Penelitian ini menggunakan 2 faktor perlakuan yaitu suhu aktivasi (500°C, 600°C, 700°C) dan waktu aktivasi (30 menit, 45 menit, 60 menit) dengan masing-masing perlakuan lima kali ulangan. Penelitian dilakukan dengan proses pembuatan arang dari limbah batang pisang dalam *retort* listrik pada suhu 400°C selama 1,5 jam. Pengujian kualitas arang aktif meliputi rendemen arang aktif, kadar air arang aktif, kadar zat mudah menguap, kadar abu, daya serap iodium, daya serap benzena dan daya serap metilen biru. Arang aktif dengan daya serap terhadap iodium tertinggi dimanfaatkan untuk menjernihkan air limbah batik.

Hasil penelitian memberikan informasi meliputi rendemen arang aktif limbah batang pisang kepok berkisar antara 71,95-79,22%; kadar air 6,62-7,49%; kadar zat mudah menguap 12,48-29,26%; kadar abu 39,29-44,73%; kadar karbon terikat 29,76-36,02%; daya serap terhadap iodium 766,48-868,00 mg/g; daya serap terhadap benzena 6,99-11,27%; daya serap terhadap metilen biru 99,50-113,03 mg/g. Kondisi optimal arang aktif dari batang pisang sebagai absorben yaitu perlakuan suhu aktivasi 700°C dan lama aktivasi 45 menit.

Analisis yang digunakan meliputi pengujian warna, pH, zat padat tersuspensi, fenol, COD, BOD, dan NO<sub>2</sub>. Penelitian pemanfaatan arang aktif limbah batang pisang digunakan untuk memperbaiki kualitas air dari limbah cair industri batik. Hasilnya menunjukkan peningkatan kualitas air limbah batik yaitu adanya penurunan nilai BOD sebesar 60,64%, COD 55,56%, Nitrit 25,49%, fenol 54,76%, TSS 43,78% dan warna 62,22%.

*Kata Kunci: Arang aktif, batang pisang, waktu aktivasi, suhu aktivasi*

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## UTILIZATION OF KEPOK BANANA (*Musa acuminata*) STEM WASTE AS ACTIVATED CARBON RAW MATERIAL

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### ABSTRACT

Indonesia has 137 types of bananas as a food commodity. Bananas provide the largest contribution to the production and consumption of national fruits. Several types of bananas have a high selling value and are favored of public. The stem waste of banana that is generated during harvesting is underutilized other than as animal feed on a small scale.

Banana stem waste is a research raw material. The research used a completely randomized design. The research uses 2 treatment factors, which were activation temperature (500°C, 600°C, 700°C) and activation duration (30 minutes, 45 minutes, 60 minutes) with five replications of each treatment. The research was conducted with banana waste stem carbonization in an electric retort at 400°C for 1.5 hours. The result of activated charcoal were tested in term of their quality is yield, moisture content, volatile matter content, ash content, fixed carbon content, absorption of benzene, absorption of iodine, and absorption of methylene blue. The activated charcoal with the highest absorption of iodine was utilized for purifying batik wastewater.

The result showed that the optimal conditions of activated charcoal from banana waste stem was produced from a combination of 700°C activation temperature with activation time of 45 minutes. The results of the research provide information covering the yield of activated charcoal from waste Kepok banana stems with following: 71.95-79.22%; moisture content of 6.62-7.49%, volatile matter content of 12.48-29.26%; ash content of 39.29-44.73%; fixed carbon content of 29.76-36.02%; absorption of iodine 766.48-868.00 mg/g; absorption of benzene 6.99-11.27%; and absorption of methylene blue 99.50-113.03 mg/g.

The analysis carried out includes color, pH, total suspended solid, fenol, COD, BOD, and NO<sub>2</sub>. The results of this research to improve the quality of wastewater batik industry showed an increase in the quality of batik wastewater. The activated carbon from waste banana stem successfully decreased the value BOD by 60.64%, COD 55.56%, Nitrit 25.49%, fenol 54.76%, TSS 43.78% and color 62.22%.

*Keyword: Activated charcoal, banana stem, activation time, activation temperature*

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