

**PENGARUH SUHU DAN KONSENTRASI BAHAN PENGAKTIF NATRIUM  
KARBONAT TERHADAP RENDEMEN DAN KUALITA ARANG AKTIF  
KAYU BABUL (*Acacia nilotica* (L) Willd Ex. Del)**

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**INTISARI**

Arang aktif merupakan jenis arang yang mempunyai kemampuan adsorpsi yang tinggi terhadap gas dan cairan karena luas permukaannya yang tinggi sehingga menjadikannya lebih unggul bila dibandingkan arang biasa. Dengan membuat arang aktif dari bahan baku kayu babul diharapkan dapat meningkatkan nilai komersial kayu pohon babul yang selama ini pertumbuhan-nya secara alami di Taman Nasional Baluran sangat cepat sehingga mengurangi luasan lapangan rumput yang merupakan sumber pakan bagi satwa mamalia besar.

Rancangan penelitian yang digunakan adalah Rancangan Acak Lengkap dengan percobaan faktorial. Faktor yang digunakan adalah suhu aktivasi dan konsentrasi bahan pengaktif dengan masing-masing 5 perlakuan. Penelitian dilakukan dengan mengarangkan kayu dalam retort listrik pada suhu 400°C selama 3 jam. Arang selanjutnya direndam selama 24 jam dalam larutan Na<sub>2</sub>CO<sub>3</sub> 0; 0,5; 1; dan 1,5%. Setelah ditiriskan dan dikeringanginkan, arang diaktifasi dengan suhu 900 dan 1000°C. Setelah didapatkan arang aktif kemudian diuji rendemen dan kualitasnya yang meliputi kadar air, kadar abu, kadar zat menguap, kadar karbon, daya serap arang aktif terhadap iod, benzene dan metilin biru.

Hasil pengujian arang aktif dari bahan kayu babul menunjukkan bahwa rendemen berkisar 46,00-55,01%, kadar air 6,35-8,32%, kadar abu 6,29-9,65%, kadar zat menguap 17,62-29,91%, kadar karbon 66,38-70,87%, daya serap terhadap iod 1110;38-1744,88 mg/g, daya serap terhadap benzene 12,11-17,09%, daya serap terhadap metilin biru 65,86-86,27 ml/g. Berdasarkan besarnya daya serap maka kualitas arang aktif terbaik dihasilkan dari penggunaan konsentrasi Na<sub>2</sub>CO<sub>3</sub> 1% dan suhu aktivasi 1000°C. Hasil analisa keragaman pada taraf uji 5% menunjukkan bahwa interaksi antara suhu dan konsentrasi berpengaruh terhadap rendemen dan zat menguap arang aktif sedang pada taraf uji 1% menunjukkan bahwa interaksi antara suhu dan konsentrasi sangat berpengaruh terhadap daya serap arang aktif terhadap iod. Kadar sineol minyak kayu putih setelah dijernihkan dengan arang aktif dari bahan kayu babul tidak berubah namun arang aktif dari bahan kayu babul dapat menarik amonia, nitrat dan detergen serta menjernihkan air selokan.

**Kata kunci:** Kayu babul, arang aktif, dan adsorpsi

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**THE INFLUENCE OF TEMPERATURE AND CONCENTRATION OF ACTIVATOR  
SODIUM CARBONATE ON ACTIVE CARBON YIELD AND QUALITY OF  
BABUL WOOD (*Acacia nilotica* (L) Willd Ex. Del)**

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**ABSTRACT**

Active carbon is the kind of carbon having high adsorption strength on gas and liquid. It is caused of its wide surface and this condition makes the properties of active carbon better than common carbon. The manufacturing of active carbon is intended to increase the commercial values of babul trees. The growth and spread of babul trees in Baluran National Park take up the most savanna; in reality the presence of savanna is more needed as a source of herbivore food than babul trees.

The sampling technique used in this research was completely randomized design and the factors involved were activation temperature and activator concentration with five replications each. Research was conducted by carbonizing wood in a retort with a temperature at 400°C for 3 hours. Afterwards, charcoal was soaked for 24 hours in solution of sodium carbonate 0; 0,5; 1; and 1,5 %. After being lifted and drained, the charcoal was activated with a temperature at 900°C and 1000°C then the activated charcoal was tested to obtain the yield and quality covering: moisture content, ash content, volatile mater, fixed carbon, adsorption strength on iodine, benzene and blue metilyne.

The result shown that the yield of active carbon ranged from 46,00–55,01%, moisture content 6,35-8,32%, ash content 6,29-9,65%, volatile matter 17,62-29,91%, fixed carbon 66,38-70,87%, adsorption strength on iodine 1110,38 - 1744,88 mg/g, benzene 12,11 - 17,09%, blue metilyne 65,86 - 86,27 ml/g. Based on adsorption strength, the best quality of active carbon was obtained from treatment with concentration  $\text{Na}_2\text{CO}_3$  1% and activation temperature at 1000°C. The analyses results on 5% confidence level showed that interaction between temperature and activator concentration had significance on the yield and volatile mater, while on 1% confidence degree showed that interaction between temperature and activator concentration had very significance on adsorption strength on iodine. The cineol content on cajuput oil was remain unchanged after was treated with active carbon however active carbon from babul wood could purify the ditch water and adsorbs ammonia, nitrate, and detergent.

**Keywords:** Babul trees, active carbon, and adsorption

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