

## PENGARUH VARIASI DIAMETER POHON DAN SUHU KARBONISASI TERHADAP SIFAT ARANG KAYU HIBRID AKASIA

(*Acacia mangium* × *Acacia auriculiformis*)

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### INTISARI

Konsumsi energi nasional yang masih didominasi oleh bahan bakar fosil mendorong perkembangan energi alternatif yaitu energi baru terbarukan (EBT). EBT dari energi biomassa hutan dapat dihasilkan dari pengolahan kayu energi menjadi berbagai bentuk produk yang bersumber dari Hutan Tanaman Industri Energi (HTI-E). Salah satu jenis tanaman energi yang berpotensi untuk dikembangkan adalah jenis-jenis Akasia. Hibrid Akasia merupakan jenis tanaman akasia hibrid yang dihasilkan dari persilangan antara *Acacia mangium* dan *Acacia auriculiformis*, baik secara alami maupun buatan. Sampai saat ini, karakteristik energi kayu hibrid Akasia dalam arang masih terbatas. Oleh karena itu, penelitian ini dilakukan untuk mengetahui pengaruh variasi diameter pohon serta suhu karbonisasi terhadap sifat arang kayu hibrid Akasia.

Penelitian ini menggunakan pohon hibrid Akasia berumur 10 tahun dengan tiga variasi diameter, yaitu 7, 8 dan 10 cm. Selanjutnya, pohon-pohon tersebut dibentuk menjadi kepingan. Sampel kemudian dibuat dengan mengarangkan kepingan kayu hibrid Akasia pada dua suhu karbonisasi yang berbeda, yaitu 350 dan 450°C. Sampel hasil karbonisasi kemudian dilakukan pengujian sifat arang dengan mengikuti standar ASTM. Parameter pengujian meliputi rendemen, kadar air, berat jenis, kadar volatil, kadar abu, kadar karbon terikat, dan nilai kalor.

Hasil penelitian menunjukkan bahwa tiap variasi diameter pohon hibrid Akasia memiliki sifat arang yang berbeda nyata pada kadar air, kadar volatil, kadar abu, dan kadar karbon terikat. Interaksi antara variasi diameter pohon dan suhu karbonisasi menunjukkan pengaruh yang berbeda nyata hanya pada kadar air. Sifat-sifat arang terbaik ditemukan dalam kombinasi variasi diameter 7 cm dengan suhu karbonisasi 350°C yaitu kadar abu 15,36%, kadar karbon terikat 34,25%, dan nilai kalor 6005 kal/g.

**Kata kunci:** HTI-E, hibrid Akasia, arang, diameter, suhu

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***THE INFLUENCE OF TREE DIAMETER VARIATIONS AND  
CARBONIZATION TEMPERATURE ON THE PROPERTIES OF ACACIA  
HYBRID (*Acacia mangium* × *Acacia auriculiformis*) WOOD CHARCOAL***

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**ABSTRACT**

The national energy consumption that is dominated by fossil fuels drives the development of alternative energy, namely renewable energy (RE). RE from forest biomass energy can be produced through the processing of energy wood into various forms of products sourced from Energy Industrial Tree Plantation (HTI-E). One of the potential energies plants is *Acacia* spp. *Acacia* hybrid is a hybrid produced from crossbreeding between *Acacia mangium* and *Acacia auriculiformis* naturally or artificially. Currently, the energy characteristics of *Acacia* hybrid charcoal are still limited. Therefore, the aims of this study was to determine the influence of tree diameter variations and carbonization temperature on the properties of *Acacia* hybrid wood charcoal.

This research used 10-year-old *Acacia* hybrid tress with three different diameter variations, namely 7, 8 and 10 cm. Subsequently, these trees were processed into chips. Samples were then created by carbonizing the wood chips at two different carbonization temperature, namely 350 and 450°C. The resulting charcoal samples were tested for energy properties following ASTM standards. The testing parameters included yield, moisture content, specific gravity, volatile content, ash content, fixed carbon content, and calorific value.

The research results indicates that each tree diameter variation of *Acacia* hybrid has significantly different energy properties in charcoal, especially in terms of moisture, volatile, ash, and fixed carbon content. The interaction between tree diameter variations and carbonization temperature shows a significant difference only in moisture content. The best charcoal properties were found in the combination of a 7 cm diameter variation with a carbonization temperature of 350°C, with ash content at 15.36%, fixed carbon content at 34.25%, and calorific value at 6005 cal/g.

**Keywords:** HTI-E, *Acacia* hybrid, charcoal, diameter, temperature

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