

KARAKTERISTIK ENERGI BAMBU TUTUL (*Bambusa maculata*) BERDASARKAN ARAH AKSIAL DAN TEMPAT TUMBUH YANG BERBEDA

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INTISARI

Produksi energi saat ini harus mempertimbangkan keandalan, keberlanjutan, dan aspek ramah lingkungan. Banyak negara di seluruh dunia, termasuk Indonesia, tengah berusaha keras untuk beralih dari penggunaan energi fosil (konvensional) ke energi terbarukan. Sumber energi terbarukan yang banyak adalah biomassa. Bambu tutul (*Bambusa maculata*) adalah salah satu tanaman yang memiliki perkembangan yang cepat. Karakteristik energi bambu dipengaruhi oleh berbagai faktor, termasuk struktur anatomi dan kondisi lingkungan tempat tumbuhnya. Arah aksial bambu dan lokasi geografis yang berbeda memberikan variasi pada sifat energi yang dimiliki. Penelitian ini bertujuan untuk mengidentifikasi adanya interaksi antara arah aksial dan lokasi tempat tumbuh terhadap karakteristik energi bambu tutul.

Bahan penelitian berupa bilah/belahan bambu disertai kulitnya dengan ukuran panjang 20 cm kemudian disesuaikan ukurannya dengan dimensi panjang 4 cm, lebar 2 cm, dan tebal 1 cm yang memiliki berat 2 gram yang berasal dari tiga batang individu bambu tutul berasal dari 4 tempat tumbuh berbeda pada Desa Genggelang, Keruak, Tempos, Kabul di Pulau Lombok. Untuk menentukan variasi arah aksial, bagian ruas dikumpulkan pada interval 2 m dari 2 hingga 8 m di atas tanah. Bambu tutul diuji kualitasnya dengan sifat fisik (kadar air, berat jenis, dan nilai kalor) dan sifat proximat (kadar abu, kadar zat mudah menguap, dan kadar karbon terikat).

Interaksi antara faktor arah aksial dan lokasi tempat tumbuh berpengaruh pada taraf 1% terhadap kadar air dan kadar abu. Hasil penelitian menunjukkan bambu tutul yang digunakan memiliki parameter kualitas sebagai berikut: kadar air 9,163-10,333%; berat jenis 0,720-0,871; nilai kalor 3806-4137 kal/g; kadar abu 2,146-5,696%; kadar zat mudah menguap 75,220-81,129%; dan kadar karbon terikat 16,530-20,429%. Bambu tutul yang memiliki karakteristik energi terbaik didapatkan pada kombinasi arah aksial 2-4 meter dan lokasi tempat tumbuh di Keruak.

Kata kunci: bambu tutul, energi, tempat tumbuh, arah aksial, nilai kalor

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THE ENERGY CHARACTERISTICS OF MACULATA BAMBOO (*Bambusa maculata*) BASED ON AXIAL DIRECTION AND DIFFERENT SITES

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ABSTRACT

Energy production today must consider reliability, sustainability, and environmental friendliness. Many countries worldwide, including Indonesia, are making significant efforts to transition from fossil (conventional) energy to renewable energy sources. Biomass is a widely available renewable energy source, and maculata bamboo (*Bambusa maculata*) is one of the fastest-growing plants. The energy characteristics of bamboo are influenced by various factors, including its anatomical structure and the environmental conditions of its site. The axial direction of bamboo and different geographical locations contribute to variations in its energy properties. This study aims to identify the interaction between axial direction and site on the energy characteristics of maculata bamboo.

The research material consisted of bamboo slats or splits with their outer skin intact, measuring 20 cm in length, then adjusted to dimensions of 4 cm in length, 2 cm in width, and 1 cm in thickness, with a weight of 2 grams. These samples were taken from three individual bamboo culms of *Bambusa maculata* originating from four different sites: Genggelang, Keruak, Tempos, and Kabul villages on Lombok Island. To determine axial variation, internodes were collected at intervals of 2 meters from 2 to 8 meters above the ground. The maculata bamboo was evaluated for its quality based on physical properties (moisture content, specific gravity, and calorific value) and proximate properties (ash content, volatile matter content, and fixed carbon content).

The interaction between axial direction and site factors significantly affects moisture content and ash content at the 1% level. The study results indicated that the quality parameters of the maculata bamboo used were as follows: moisture content of 9.163-10.333%; specific gravity of 0.720-0.871; calorific value of 3806-4137 cal/g; ash content of 2.146-5.696%; volatile matter content of 75.220-81.129%; and fixed carbon content of 16.530-20.429%. The best energy characteristics of maculata bamboo were obtained with an axial direction of 2-4 meters and a site in Keruak.

Keywords: maculata bamboo, energy, site, axial direction, calorific value.

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