

ANALISIS SIFAT KIMIA DAN ENERGI BIOMASA JATI (*Tectona grandis* L.f.) PADA TIGA SUMBER BENIH YANG BERBEDA

Oleh:

Sri Dewi Diah Fitaloka¹, Denny Irawati²

INTISARI

Kayu jati (*Tectona grandis* L.f.) merupakan jenis kayu unggul yang banyak digunakan oleh masyarakat. Kebutuhan yang tinggi akan kayu tersebut, menuntut sistem pemuliaan dan penggunaan benih-benih unggul. Pemanenan pohon jati pada umumnya hanya memanfaatkan bagian batang komersial dan meninggalkan berbagai biomasa dari bagian pohon yang lain di lapangan. Sejauh ini karakteristik bagian pohon limbah tebangan jati tersebut belum banyak diteliti potensinya sebagai sumber energi. Perbedaan sumber benih diduga mempengaruhi jumlah dan sifat biomasa dari berbagai bagian pohon jati tersebut. Penelitian ini bertujuan untuk mengetahui pengaruh interaksi antara sumber benih dan biomasa dari berbagai bagian pohon terhadap sifat kimia dan energinya.

Penelitian ini menggunakan sembilan pohon jati (*Tectona grandis* L.f.) yang berasal dari tiga sumber benih yang berbeda, yaitu konvensional, klon, dan JPP dengan umur 15 tahun. Dan kesembilan pohon tersebut diambil bagian-bagian pohon non komersial, yaitu batang bagian ujung, cabang, dan ranting. Tiap-tiap bagian pohon kemudian dianalisis kandungan kimianya, yaitu analisis kadar ekstraktif larut air panas, ekstraktif larut etanol-toluena, lignin Klason, dan lignin terlarut asam. Selain itu juga dianalisis sifat fisiknya, yaitu kadar air dan berat jenis, serta sifat energinya seperti, kadar abu, kadar zat mudah menguap, kadar karbon terikat dan nilai kalor.

Hasil penelitian menunjukkan bahwa perbedaan bagian pohon pada jati memiliki sifat kimia dan energi yang tidak berbeda nyata kecuali kadar ekstraktif larut air panas, kadar zat mudah menguap, dan nilai kalor. Perbedaan sumber benih mempengaruhi perbedaan sifat kadar ekstraktif larut air panas, kadar abu, dan nilai kalor secara nyata. Interaksi antara sumber benih dan bagian pohon memberikan pengaruh yang signifikan terhadap kadar ekstraktif larut air panas dan kadar abu. Kombinasi perlakuan terbaik adalah biomasa batang bagian ujung yang berasal dari sumber benih konvensional dengan karakteristik, yaitu kadar air 4,216%, berat jenis 0,766, kadar abu 0,863%, kadar volatil 86,508%, kadar karbon terikat 8,414%, dan nilai kalor 4.650,719 kal/g.

Kata kunci: *Tectona grandis*; sumber benih; bagian pohon; biomassa; sifat kimia; sifat energi.

¹ Mahasiswa Departemen Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada.

² Dosen Departemen Teknologi Hasil Hutan, Fakultas Kehutanan, Universitas Gadjah Mada.

ANALYSIS OF CHEMICAL AND ENERGY PROPERTIES OF TEAK (*Tectona grandis* L.f.) BIOMASS IN THREE DIFFERENT SEED SOURCES

By:

Sri Dewi Diah Fitaloka¹, Denny Irawati²

ABSTRACT

Teak wood (*Tectona grandis* L.f.) is one of superior wood that is used by the people. The high need for wood insist a breeding system and superior seeds to use. Harvesting of teak commonly used the commercial stem part and leaves the various biomass from other parts at field. The characteristics of teak part at felling waste tree have not been studied as potential energy source so far. The differences of sources seed had been estimated to affect the amount and characteristics of biomass from various parts of teak tree. This study aims to determine the effect of interactions between seed sources and biomass from various parts of tree on their chemical and energy properties.

This study used nine teak trees (*Tectona grandis* L.f.) originating from three different seed sources that are conventional, clone, and JPP at 15 years. From those nine trees were taken the part of non-commercial specifically peak stem, branches, and twigs. Each part of tree then analyzed for its chemical content consist of extraction of soluble hot water, extractive soluble ethanol-toluene, lignin Klason, and acid-soluble lignin. In addition it was also analyzed on the physical properties, consist of moisture content and specific gravity then its energy properties such as ash content, volatile matter content, fix carbon content and calorific value.

The results showed that differences at parts of teak sepecially in chemical and energy properties did not giving significantly different except for extractive hot water soluble, volatile substances, and calorific values. The different sources of seeds affect the differences of properties of extractive of hot water soluble, ash content, and heating value significantly. The interaction between seed sources and teak parts has a significant effect on extraction of hot water and ash content. The best combination of treatments is the peak stem biomass from the conventional seed source with characteristics 4.216% moisture content, 0.766% density, 0.863% ash content, 86.508% volatile content, bonded carbon content 8.414%, and calorific value 4,650,719 cal/g.

Keywords: *Tectona grandis*; source of seed; parts of tree; biomass; chemical; energy properties.

¹The student Department of Forest Product Technology, Forestry Faculty, Gadjah Mada University

²Lecture Department of Forest Product Technology, Forestry Faculty, Gadjah Mada University