

KARAKTERISTIK KIMIA DAN POTENSI ENERGI PADA *INDIGOFERA TINCTORIA* (LINN.) BERDASARKAN DIAMETER BATANG DAN JENIS BIOMASSA

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INTISARI

Pembangkit listrik tenaga biomasa (PLT-Bm) beberapa telah dibangun di Indonesia. Kebutuhan biomasa untuk bahan baku pembangkit listrik cukup besar sehingga perlu adanya hutan tanaman industri energi (HTI-E) untuk memenuhi pasokannya. Belum banyak spesies yang dikembangkan untuk HTI-E. Salah satu spesies yang potensial untuk HTI-E namun belum diketahui karakteristik energinya adalah Tarum (*Indigofera tinctoria* (Linn.)). Selama ini tarum banyak dimanfaatkan daunnya untuk pewarna alam dan pakan ternak, namun karakteristik kayunya untuk energi belum diketahui. Tujuan penelitian ini adalah pengaruh diameter batang dan jenis biomassa terhadap karakteristik kimia dan energi pohon *I. tinctoria* (Linn.).

Penelitian ini menggunakan 9 pohon tarum (*Indigofera tinctoria* (Linn.)) umur 20 bulan yang diambil dari Wanagama. Pohon tersebut dikelompokkan menjadi 3 kelas diameter dan dipisahkan antara bagian batang, cabang, dan rantingnya. Penelitian ini dilakukan dengan mengamati sifat kimia yang meliputi kadar ekstraktif etanol-toluen, Klason-lignin, dan lignin terlarut asam serta mengamati karakteristik energinya meliputi kadar abu, kadar volatile, kadar karbon terikat, dan nilai kalor. Hasil pengujian sifat kimia dan gula pereduksi dianalisis dengan metode analisis keragaman (ANOVA), kemudian dilanjutkan uji Tukey HSD (*Honestly Significant Difference*).

Hasil penelitian ini menunjukkan bahwa interaksi antara diameter pohon dan jenis biomasa memberikan pengaruh nyata terhadap sifat kimia kayu tarum yaitu meliputi kadar ekstraktif etanol-toluen, kadar lignin, dan kadar lignin terlarut asam, serta kadar abu. Kadar ekstraktif etanol-toluen kayu tarum pada penelitian ini berkisar antara 2,69% - 5,34%, kadar Klason-lignin 16-10% -23,10%, kadar lignin terlarut asam 0,11%-0,38%, dan kadar abu 0,11% - 1,17%.

Kata kunci: tarum, nilai kalor, biomassa, cabang, energi

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**CHEMICAL CHARACTERISTICS AND ENERGY POTENTIAL OF INDIGOFERA
TINCTORIA (LINN.) BASED ON STEM DIAMETER AND BIOMASS TYPE**

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ABSTRACT

Several biomass power plants have been built in Indonesia. The need for biomass for power plant feedstock is large enough to require energy plantation forests (HTI-E) to fulfill the supply. Not many species have been developed for E-HTI. One of the species that has potential for E-TI but its energy characteristics are not yet known is Tarum (*Indigofera Tinctoria* (Linn.)). So far, Tarum is widely utilized for its leaves for natural dyes and animal feed, but its wood characteristics for energy are not yet known. The aim of this research is the impact of stem diameter and biomass type on the chemical and energy characteristics of *I. tinctoria* (Linn.) trees.

This research used 9 tarum trees (*Indigofera tinctoria* (Linn.)) aged 20 months taken from Wanagama. The trees were grouped into 3 diameter classes and separated between the stem, branches, and twigs. This research was conducted by observing chemical properties including ethanol-toluene extractive content, Klason-lignin, and acid soluble lignin and observing its energy characteristics including ash content, volatile content, bound carbon content, and calorific value. The results of chemical properties and reducing sugars were analyzed using the analysis of variance method, followed by the Tukey HSD (Honestly Significant Difference) test.

The results of this research showed that the interaction between tree diameter and biomass type gave a significant effect on the chemical properties of tarum wood, which included ethanol-toluene extractive content, lignin content, and acid soluble lignin content, as well as ash content. Extractive ethanol-toluene content of tarum wood in this research ranged from 2.69% - 5.34%, Klason-lignin content 16-10% -23.10%, acid soluble lignin content 0.11%-0.38%, and ash content 0.11% - 1.17%.

Keywords: tarum, energy source, biomass, branch, energy

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