

KANDUNGAN DAN AKTIVITAS ANTIOKSIDAN EKSTRAKTIF KAYU TIGA KLON HIBRID AKASIA (*Acacia mangium* x *Acacia auriculiformis*)

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INTISARI

Penyakit busuk hati pada hutan tanaman *Acacia mangium* menimbulkan penurunan produktivitas yang cukup signifikan. Kandungan ekstraktif kayu sangat mempengaruhi ketahanan terhadap busuk hati. Hibrid akasia (*Acacia mangium* x *Acacia auriculiformis*) mempunyai banyak keunggulan yang diantaranya pertumbuhan yang cepat dan ketahanan yang lebih tinggi terhadap hama dan penyakit. Strategi pemuliaan hibrid akasia dikembangkan oleh Balai Besar Penelitian dan Pengembangan Bioteknologi dan Pemuliaan Tanaman Hutan dan menghasilkan tiga klon unggul berdasarkan pertumbuhan. Ekstraktif kayu hibrid akasia belum banyak diteliti. Penelitian ini bertujuan untuk mengetahui kadar ekstraktif, kadar fenolat, flavonoid, dan flavanol total, serta aktivitas antioksidannya.

Sampel kayu diambil dari tiga klon terbaik (klon 44, 25, dan 16) yang ditanam di Wonogiri, masing-masing klon berjumlah tiga pohon. Bagian gubal, teras luar, dan teras dalam diperoleh dari piringan kayu bagian pangkal. Kadar ekstraktif didapatkan secara bertingkat dengan menggunakan tiga jenis pelarut yaitu n-heksana, metanol, dan air panas. Kadar senyawa fenolat, flavonoid, dan flavanol dihitung secara kolorimetris. Aktivitas antioksidan diukur dengan menggunakan metode pengikatan radikal 1,1-difenil-2-pikrilhidrasil (DPPH).

Hasil pengukuran kadar ekstraktif pada tiga pelarut (n-heksana [KEH], metanol [KEM], dan air panas [KEAP]) berkisar antara 0,69 – 1,70 %; 1,51 – 10,86 %; dan 0,51 – 1,16 % secara berurutan. Kadar fenolat total (KFT) pada tiga jenis pelarut (KFTH, KFTM, dan KFTA) berkisar antara 3,68 – 10,41; 76,83 – 448,35; dan 43,28 – 198,92 mg asam galat/g sampel secara berurutan. Kadar flavonoid total (KVT) pada tiga jenis pelarut (KVTH, KVTM, dan KVTA) berkisar antara 4,23 – 41,51; 29,55 – 133,71; dan 7,70 – 29,37 mg kuersetin/g sampel secara berurutan. Kadar flavanol total (KLT) pada tiga jenis pelarut (KLTH, KLTM, dan KLTA) berkisar antara 28,74 – 66,90; 83,39 – 247,18; dan 7,08 – 29,21 mg katekin/g sampel secara berurutan. Aktivitas antioksidan dipengaruhi secara nyata oleh faktor radial dengan nilai IC_{50} terkuat pada bagian teras dalam kayu dengan nilai 255,77 ppm (IC_{50} asam galat terukur 39,00 ppm). Klon 16 menunjukkan kadar ekstraktif, flavonoid, dan flavanol kayu teras paling tinggi dari ketiga klon, mengindikasikan ketahanan yang lebih tinggi dari serangan jamur busuk hati.

Kata kunci: fenolat, flavonoid, flavanol, radial, DPPH

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CONTENT AND ANTIOXIDANT ACTIVITY OF THREE CLONES ACACIA HYBRID (*Acacia mangium* x *Acacia auriculiformis*) WOOD EXTRACTIVE

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ABSTRACT

Heartrot disease on *Acacia mangium* plantation has significantly reduce its productivity. Wood extractive content is known to affect the resistance to heartrot. *Acacia* hybrid (*Acacia mangium* x *Acacia auriculiformis*) has many advantages, including fast growth and more resistant to pests and diseases. A breeding strategy of *Acacia* hybrid was being developed by Center for Forest Biotechnology and Tree Improvement Yogyakarta and has produced 3 superior clones in growth. The extractive content of *Acacia* hybrid wood has not been widely studied. The purpose of this study is to observe the extractive content of *Acacia* hybrid wood e.g. total phenolic, flavonoid, flavanol and antioxidant activity

Wood samples were taken from three of the best clones (clone 44, 25, and 16) planted in wonogiri, each clone of 3 trees. Sapwood, outer heartwood, and inner heartwood sections were separated from wood discs at bottom stem. Extractive content was extracted by successive extraction with three different solvents (n-hexane, methanol, and hot water). Total phenolic, flavonoid, and flavanol content were measured with colorimetric assay method. Antioxidant activity was measured with 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay.

The result showed that the extractive content using 3 different solvents (n-hexane [KEH], methanol [KEM], and hot water [KEAP]) were ranged from 0.69 – 1.70 %; 1.51 – 10.86 %; and 0.51 – 1.16 % respectively. Total phenolic content (KFT) from three different solvents extract (KFTH, KFTM, and KFTA) were ranged from 3.68 – 10.41; 76.83 – 448.35; and 43.28 – 198.92 mg gallic acid/g sample, respectively. Total flavonoid content (KVT) from three different solvents extract (KVTH, KVTM, and KVTA) were ranged from 4.23 – 41.51; 29.55 – 133.71; and 7.70 – 29.37 mg quercetin/g sample, respectively. Total flavanol content (KLT) from three different solvents extract (KLTH, KLTM, and KLTA) were ranged from 28.74 – 66.90; 83.39 – 247.18; and 7.08 – 29.21 mg catechin/g sample, respectively. Antioxidant activity was significantly affected by radial factor with strongest activity exhibited by inner heartwood extract with IC₅₀ value of 255.77 ppm (Gallic acid IC₅₀ showed value of 39.00 ppm). Clone 16 shown higher heartwood extractive, flavonoid, and flavanol content, indicating better resistance to heartrot fungi between the 3 clones.

Keywords: phenol, flavonoid, flavanol, radial direction, DPPH

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