SIFAT FISIKA DAN MEKANIKA KAYU JABON PUTIH (*Neolamarckia cadamba* Roxb.) PADA KEDUDUKAN AKSIAL DARI TIGA FAMILI DI KHDTK WONOGIRI

Oleh:

Berliawan Rizal Mahesa[1], Fanny Hidayati[1], and Sri Sunarti[2]

INTISARI

Kegiatan pemuliaan jabon putih (*Neolamarckia cadamba* Roxb.) telah dilakukan oleh Balai Besar Penelitian Pengembangan Bioteknologi dan Pemuliaan Tanaman Hutan (BBPBPTH) Yogyakarta dengan membangun Kebun Benih Semai Uji Keturunan (KBSUK) generasi pertama (F-1) sebagai sumber bibit unggul yang menghasilkan famili terbaik dari beberapa famili. Informasi mengenai sifat fisika dan mekanika kayu dari famili terbaik masih sangat terbatas. Penelitian ini bertujuan untuk mengetahui sifat fisika dan mekanika kayu *N. cadamba* dari tiga famili terbaik pada kedudukan aksial pohon.

Sampel penelitian diperoleh dari 9 pohon *N. cadamba* umur 10 tahun yang ditanam di Kawasan Hutan Dengan Tujuan Khusus (KHDTK) Wonogiri. Rancangan penelitian berupa acak lengkap secara faktorial dengan dua faktor yaitu famili (23, 11, dan 6) dan kedudukan aksial (pangkal, tengah, dan ujung). Pengujian yang dilakukan mengacu pada *British Standard* 373:1957.

Hasil penelitian menunjukkan bahwa kadar air segar dan kering udara sebesar 91,02% dan 14,90%. Berat jenis segar, kering udara, dan kering tanur berturut-turut sebesar 0,37; 0,38; dan 0,41. Penyusutan radial, tangensial, dan longitudinal dari kondisi segar ke kering udara berturut-turut sebesar 0,74%, 1,97%, 0,36%; sedangkan dari kondisi segar ke kering tanur sebesar 2,42%, 5,62%, 0,72%. Rasio T/R kondisi segar ke kering udara dan kering tanur adalah 2,72 dan 2,45. Keteguhan lengkung statik pada batas proporsi, MoE, dan MoR adalah 210,62 kg/cm^2, 59,11 $\times 10^3$ kg/cm^2, dan 483,34 kg/cm^2. Keteguhan tekan sejajar serat dan tegak lurus serat adalah 295,62 kg/cm^2 dan 104,58 kg/cm^2. Hasil analisis menunjukkan bahwa famili berpengaruh nyata terhadap kadar air (segar), berat jenis (segar, kering udara, kering tanur), penyusutan kondisi segar ke kering udara dan kering tanur (arah radial dan tangensial), rasio T/R kondisi segar ke kering tanur, keteguhan lengkung statik pada MoE, dan keteguhan tekan sejajar serat. Kedudukan aksial berpengaruh nyata pada penyusutan arah tangensial kondisi segar ke kering udara. Dari 3 famili yang diuji, famili 6 memiliki sifat fisika dan mekanika yang terbaik dan pada kedudukan aksial kayu terdapat di bagian tengah.

Kata kunci: *Neolamarckia cadamba*, sifat fisika, sifat mekanika, famili, kedudukan aksial.

[1] Departemen Teknologi Hasil Hutan Fakultas Kehutanan, UGM
[2] Badan Riset dan Inovasi Nasional

PHYSICAL AND MECHANICAL PROPERTIES OF WHITE JABON (*Neolamarckia cadamba* Roxb.) WOOD IN AXIAL POSITIONS OF THREE FAMILIES FROM KHDTK WONOGIRI

By:

Berliawan Rizal Mahesa[1], Fanny Hidayati[1], and Sri Sunarti[2]

ABSTRACT

The breeding program of jabon putih (*Neolamarckia cadamba* Roxb) was carried out by the Center for Forest Biotechnology and Tree Improvement Research Yogyakarta by establishing first generation (F-1) of progeny trial which converted to seedling seed orchard to produce superior seeds from the selected families. The information of jabon putih physical and mechanical wood properties of the best families is still limited. The aim of this research was to determine the physical and mechanical properties of *N. cadamba* from the best three families on axial positions.

The research sample was obtained from 9 trees of 10-year-old *N. cadamba* planted in Kawasan Hutan Dengan Tujuan Khusus (KHDTK) in Wonogiri. The research design was completely randomized with a factorial pattern with two factors namely family (23, 11, and 6) and axial positions (base, middle, upper wood). The test method referred to British standard 373:1957.

The results showed that the moisture content by green, and air-dried condition was 91,02% and 14,90%. The value of green, air dried, and oven dried specific gravity were consecutively 0,37; 0,38; and 0,41. The shrinkage of radial, tangential, and longitudinal direction from green to air dried condition were consecutively 0,74%, 1,97%, and 0,36%. While from green to oven dried condition was 2,42%, 5,62%, and 0,72%. The T/R ratio of shrinkage results from green to air dried and oven dried condition was 2,72 and 2,45. The static bending at the proportion limit, MoE, and MoR were 210,62 kg/cm^2; 59,11 $\times 10^3$ kg/cm^2; and 483,34 kg/cm^2. The compressive strength parallel to grain and perpendicular to grain were 295,62 kg/cm^2 and 104,58 kg/cm^2. The analysis showed that families significantly affected moisture content (green), specific gravity (green, air dried, and oven dried), shrinkage from green to air dried and oven dried condition (radial and tangential directions), T/R ratio from green to oven dried condition, static bending at MoE, and compressive strength parallel to grain. The axial positions significantly affected shrinkage of tangential directions from green to air dried condition. From the 3 families test showed that famili 6 had the best physical and mechanical properties and in the axial position was located in the middle of the wood.

Keyword: *Neolamarckia cadamba*, physical properties, mechanical properties, family, axial positions

[1] Study Program of Forest Product Technology, Faculty of Forestry UGM
[2] National Research and Innovation Agency