

## **VARIASI SIFAT ANATOMI PADA ARAH AKSIAL DAN RADIAL KAYU KESEMEK (*Diospyros kaki*)**

Oleh :

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### **INSTISARI**

Pohon *D. kaki* merupakan salah satu jenis tanaman yang mudah ditemui di hutan alam dan kawasan perkebunan rakyat Karo, Sumatera Utara. *D. kaki* biasanya dimanfaatkan buahnya dan pohon yang sudah tidak produktif dalam menghasilkan buah akan ditebang dan hanya dimanfaatkan sebagai kayu bakar. Padahal kayu *D. kaki* mempunyai kayu dengan corak dekoratif berwarna gelap dan dimanfaatkan sebagai bahan pembuatan mebel dan bahan kerajinan yang bernilai mahal di Jepang.

Penelitian ini menggunakan rancangan acak lengkap dengan dua faktor yaitu arah aksial (pangkal, tengah, dan ujung batang) dan faktor arah radial (dekat hati, antara hati dan kulit, dan dekat kulit) dengan tiga kali ulangan. Parameter yang diamati yaitu panjang serat, diameter serat, diameter lumen serat, tebal dinding serat, diameter pembuluh, frekuensi pembuluh, proporsi serat, proporsi pembuluh, proporsi jari-jari, dan proporsi parenkim. Analisis struktur anatomi kayu menggunakan standar *International Association of Wood Anatomist* (IAWA).

Hasil penelitian terhadap karakteristik anatomi menunjukkan bahwa *D. kaki* memiliki porositas berupa pori semi tata lingkaran, tipe pembuluhnya soliter dan ganda radial 2 – 4, bidang perforasinya bentuk sederhana, parenkim aksialnya berupa parenkim aksial paratrakeal vasisentrik dan parenkim pita. Pada penampang radial ditemui parenkim jari – jari homoseruler dan noktah antar pembuluh dan jari – jari dengan halaman. Pada penampang tangensial ditemui jari – jari uniseriet dan multiseriet (2-3 sel) dan inklusi mineral kristal prismatic dalam parenkim. Hasil penelitian menunjukkan bahwa kayu *D. kaki* mempunyai rata-rata panjang serat 1,20 mm, diameter serat 16,61  $\mu\text{m}$ , diameter lumen 11,03  $\mu\text{m}$ , tebal dinding serat 2,79  $\mu\text{m}$ , diameter pembuluh 79,60  $\mu\text{m}$ , dan frekuensi pembuluh 5,5 per  $\text{mm}^2$ . Berdasarkan pengukuran proporsi sel kayu *D. kaki* diketahui memiliki nilai proporsi sel pembuluh 8,94 %, sel serat 64,95 %, sel parenkim jari-jari 20,03 % dan sel parenkim aksial 6,15 %. Selanjutnya, karakteristik anatomi *D. kaki* sesuai dengan ciri nomor 2, 5, 9, 10, 13, 31, 41, 47, 69, 72, 79, 87, 96, 97, 106, dan 141 berdasarkan IAWA. Faktor arah aksial tidak memberikan pengaruh terhadap dimensi dan proporsi sel. Sedangkan, pada faktor arah radial memberikan pengaruh terhadap panjang serat, diameter serat, tebal dinding serat, diameter lumen serat, dan diameter pembuluh.

Kata kunci: *D. kaki*, struktur anatomi, arah aksial, arah radial, dimensi sel, proporsi sel

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## AXIAL AND RADIAL VARIATIONS OF WOOD ANATOMICAL CHARACTERISTICS OF *Diospyros kaki*

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### ABSTRACT

*D. kaki*, a species of tree, can be easily found in natural forests and plantation area in Karo, North Sumatra. The tree produces edible fruit and once it reaches its unproductive phase, it will be harvested and utilized as firewood. On the other hand, the woods of *D. kaki* possess dark decorative patterns that is valuable to be used as materials for furniture and handicraft crafting which are expensive in Japan.

This research relied on complete randomized design with two factorials : axial position (base, middle and the top of the stem) and radial position (near-pith, between the pith-bark, and near-bark) with three replications. The observed parameters were length of the fiber, diameter of the fiber, diameter of the fiber's lumen, thickness of the fiber's wall, diameter of the vessel, frequency of the vessel, proportion of the fiber, proportion of the vessel, proportion of the radius, and proportion of the parenchymal. Moreover, for the wood anatomy structure analysis, it was based on the standards of the International Association of Wood Anatomists (IAWA).

The research on anatomical characteristics revealed that *D. kaki* has ring-porous vessels, solitary vessel groupings and radial multiples of 4 or more common, simple perforation plates, paratracheal axial parenchyma vacisentric and banded parenchyma. Within the radial cross-section parenchymal there are homocellular rays and vessel – ray pits with much reduced border. In the tangential cross-section there are rays with uniceriet and multicieriet (2 to 3 cells) and mineral inclusion of prismatic crystals within the parenchyma. The research results showed that the woods of *D. kaki* had an average fiber length of 1.20 mm, fiber diameter of 16.61  $\mu\text{m}$ , lumen diameter of 11.03  $\mu\text{m}$ , fiber wall thickness of 2.79  $\mu\text{m}$ , diameter of vessels 79.60  $\mu\text{m}$ , and frequency of vessels 5.5 per  $\text{mm}^2$ . Based on the measurement of the proportion of *D. kaki* woods, the tree had an average proportions consisting of 8.94% of wood vessels, 64.95% of fibers, 20.03% of rays, and 6.15% of parenchymas. Wood anatomical characteristics of *D. kaki* corresponding to characteristics number 2, 5, 9, 10, 13, 31, 41, 47, 69, 72, 79, 87, 96, 97, 106, and 141 according to IAWA. The axial direction factor did not have a significant effect on cell dimensions and proportions. Meanwhile, the radial direction factor gave a significant influence on the length of the fiber, diameter of the fiber, thickness of the fiber wall, diameter of the fiber lumen, and diameter of the vessel.

Keywords : *D. kaki*, anatomy structures, axial position, radial position, cell dimensions and cell proportions.

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