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| **Author(s):** | Editors IAWA Journal |
| **Title:** | **Preliminary material** |
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| **Author(s):** | Editors IAWA Journal |
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| **Author(s):** | Alexa Höhn |
| **Title:** | **Wood Anatomy of Selected West African Species of Caesalpinioideae and Mimosoideae (Leguminosae): A Comparative Study** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
| **Publication Year:** | 1999 |
| **Pages:** | 115-146 |
| **Keywords:** | Fabaceae; wood anatomy; Caesalpinioideae; West Africa; Mimosoideae; wood identification |
| **Abstract:** | Leguminosae constitute an important proportion of the charcoal sampIes recovered at archaeological sites in the West African savannas. Identification of these fragments to a level below family or subfamily was problematic, because a comparative survey was missing. Therefore, the wood anatomy of 31 species (23 genera) of Mimosoideae and Caesalpinioideae growing in the Sudanian savannas of West Africa was examined. The species were grouped into 18 types according to wood anatomical structure. The types represent single species or genera (fourteen types), two genera (three types) or three genera (one type) . The following features are regarded as suitable for a reliable delimitation and identification . Heterocellular rays and storied structure allow for a first differentiation. Enlarged, non-bordered vessel-ray pitting , nonvestured vessel-pits, silica, axial canals, septate fibres and crystals in non-eharnbered ray cells are additional features characterizing few or single types. Types without these features are delimited less easily. Parenchyma distribution and ray width are, due to variability, not as reliable , but remain necessary features for identification. Types characterized by these features only may not always be recognized correctly. Quantitative features of the vessels are not regarded as helpful for the differentiation within the set of examined species. A table (Table 1) summarizes the results for easy reference. |
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| **Author(s):** | N. Toghraie; A. Hosseinzadeh; R. Hejazi; H.R. Yazdani |
| **Title:** | **A Computerized System for Wood Research and Identification - a Technical Note** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
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| **Author(s):** | Sherwin Carlquist |
| **Title:** | **Wood and Stem Anatomy of Stegnosperma (Caryophyllales); Phylogenetic Relationships; Nature of Lateral Meristems and Successive Cambial Activity** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
| **Publication Year:** | 1999 |
| **Pages:** | 149-163 |
| **Keywords:** | cambial variants; Bark anatomy; vessel elements; Stegnospermataceae; tracheids; successive cambia; Phytolaccaceae; ecological wood anatomy; Caryophyllales |
| **Abstract:** | Wood and bark histology data on stems of two species of Stegnospenna (Stegnospermataceae, or Phytolaccaceae s.l.) is presented, complementing previous accounts . Wood of Stegnosperma is relatively primitive within Caryophyllales because of presence of tracheids , diffuse parenchyma, and both multiseriate and uniseriate rays . The solitary nature of vessels is held to be correlated with tracheid presence , as in other groups of dicotyledons with vessels solitary or nearly so. Bark anatomy is newly reported for the genus . The method of section used permits analysis of divisions in cells with primary walls. Radial rows of parenchyma ('secondary cortex') develop in the inner cortex and are perpetuated by tangential divisions collectively termed a diffuse lateral meristem here. Successive cambia form within the radial rows of parenchyma. Despite diverse terminology and interpretations in literature on plants with successive cambia, the successive cambia and their origin in Stegnosperma are believed to represent the same anatomical phenomena as in other Phytolaccaceae s.l. |
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| **Author(s):** | Simcha Lev-Yadun |
| **Title:** | **Eccentric Deposition of Secondary Xylem in Stems of the Climber Ephedra Campylopoda (Gnetales)** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
| **Publication Year:** | 1999 |
| **Pages:** | 165-170 |
| **Keywords:** | Ephedra campylopoda; Gnetales; xylem; wood formation |
| **Abstract:** | In Ephedra campylopoda, a woody climber of the Ephedraceae (Gnetales), the secondary xylem of the upper and lower sides of horizontal stems has the same structure. However, cambial activity in the lower side is greater, producing 1.5 times more xylem and 1.25 times more growth rings in thin stems and 1.8 times more xylem in thick stems. Gelatinous fibres are not formed in the upper side or elsewhere in the xylem. I suggest that this difference in cambial activity does not change the flexibility of the stems, an important adaptation for a climber. |
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| **Author(s):** | Teresa Quilhó; Helena Pereira; Hans Georg Richter |
| **Title:** | **Variability of Bark Structure in Plantation-Grown Eucalyptus Globulus** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
| **Publication Year:** | 1999 |
| **Pages:** | 171-180 |
| **Keywords:** | Eucalyptus globulus Labill; secondary structural changes; bark structure |
| **Abstract:** | The bark structure of Eucalyptus globulus Labill. grown in plantations in Central Portugal is described, based on specimens extracted at six height levels from ten 15-year-old trees. No significant variation of qualitative features between trees was observed. The non-collapsed phloem is characterised by multiseriate tangential rows of phloem parenchyma alternating with rows of phloem fibres, interspersed with large sieve tubes and their respective companion cells, and uniseriate rays . With the onset of sieve tube collapse (collapsed phloem ), some parenchyma cells expand and sclerify, the course of rays becomes irregular, and ray dilatation is initiated. The periderm is composed of a phellem of lignified cells with horseshoe thickening (phelloids), followed by a layer of cells with suberised tangential walls, and a phelloderm with a variable number of layers of thin-walled cells. Age-related secondary changes give rise to a specific within-tree pattern of axial variation. Both the intensity of sclerification of phloem parenchyma cells and the degree of ray dilatation increase with tree age. |
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| **Author(s):** | P.B. Priya; K.M. Bhat |
| **Title:** | **Influence of Rainfall, Irrigation and Age on the Growth Periodicity and Wood Structure in Teak (Tectona Grandis)** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
| **Publication Year:** | 1999 |
| **Pages:** | 181-192 |
| **Keywords:** | Tectona grandis; ring porosity; donnancy; rainfall; cambial reactivation; Vascular cambium; juvenile wood; teak |
| **Abstract:** | Growth periodicity was followed for two consecutive annual cycles to reveal the pattern of wood fonnation in plantation-grown teak at three different localities in India. Rainfall and age were the two important factors that influenced cambial activity. Cambial reactivation occurred during March-April in both years. The pre-monsoon showers broke the cambial donnancy at all three localities. Almost a month's interval was observed between bud break and initiation of radial growth . Irrespective of age and locality, a peak period of cambial activity occurred during June-July. Dormancy began during October-December, depending on the age of the trees and locality. Juvenile trees and those grown in relatively high rainfall areas had a prolonged cambial activity and retained foliage throughout the year. They produced wider rings with higher proportions of latewood. Irrigation of 5-year-old trees led to the loss of typical ring porosity of teak wood; their first three growth rings were more or less diffuse-porous. This is attributed to uninterrupted cambial activity resulting in production of rather uniform-sized vessels. |
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| **Author(s):** | Mathew A. Leitch; Rodney A. Savidge; Geoff M. Downes; Irene L. Hudson |
| **Title:** | **Induction of Tyloses in Eucalyptus Globulus 'chips'** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
| **Publication Year:** | 1999 |
| **Pages:** | 193-201 |
| **Keywords:** | sapwood; phloem; Cambium; tylosis; vessel; ray; tyloses |
| **Abstract:** | Cambial stem chips containing intact cambium between xylem and phloem, or with the phloem layer removed, were cut from the main stem axis of four-year-old Eucalyptus globulus during the winter and grown under controlled environmental conditions for seven weeks on fully defined culture media . Light microscopy revealed that tyloses were induced in sapwood vessels in the region adjacent to the cambium within these stem chips. When incubated in autoclaved double-distilled water (control medium) tyloses were produced in 3.7% and 4.7% of vessels in chips with the phloem layer intact and removed, respectively. When non-hormonal ingredients were included, tyloses developed in 69.5% and 76.1% of vessels in chips with the phloem layer intact and removed, respectively. Addition of 1.0 mg l-1 of l-naphthalene acetic acid (NAA, a synthetic auxin) to the medium had a slight, but significant, inhibitory effect on tylosis formation. |
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| **Author(s):** | Katia Ruel; Vincent Burlat; Jean-Paul Joseleau |
| **Title:** | **Relationship Between Ultrastructural Topochemistry of Lignin and Wood Properties** |
| **Source:** | IAWA Journal, Volume 20, Issue 2 |
| **Publication Year:** | 1999 |
| **Pages:** | 203-211 |
| **Keywords:** | Lignin; ultrastructural topochemistry; immunolabelling |
| **Abstract:** | The main subunits of lignin could be visualized by transmission electron microscopy (TEM) with antibodies raised against synthetic lignin model polymers. Thus, immunological probes against p-hydroxyphenyl propane, guaiacyl and mixed guaiacyl-syringyl units allowed to specifically localize the qualitative distribution of lignins in plant cell tissues . Depending on the mode of preparation of the synthetic lignin antigens , the corresponding antibodies showed specificity for condensed or noncondensed interunits linkages . This specificity is illustrated with the different labellings provided by the antibodies when applied to various wood and nonwoody materials . The results c1early show the heterogeneity of lignification between tissues but also demonstrate the microheterogeneity of lignin deposition within a a single wood cell wall. Our immunological markers were successfully applied to transgenic plants in which lignin synthesis pathways had been modified, to tissues from reaction wood, as well as to materials degraded by ligninolytic fungi. |
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| **Author(s):** | Editors IAWA Journal |
| **Title:** | **Wood Anatomy News** |
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| **Title:** | **Association Affairs** |
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