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| **Author(s):** | Marc Herman; Pierre Dutilleul; Tomas Avella-Shaw |
| **Title:** | **Growth Rate Effects on Intra-Ring and Inter-Ring Trajectories of Microfibril Angle in Norway Spruce (Picea Abies)** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 3-21 |
| **Keywords:** | Norway spruce; Picea abies (L.) Karst; Growth rate effects; cross-fieldpit aperture; intra-ring and inter-ring trajectories of microfibril angle |
| **Abstract:** | Fourteen Norway spruces [Picea abies (L.) Karst.], randomly sampled as 7 fast-grown and 7 slow-grown trees, were used to test whether an increased tree growth rate in circumference affects the intra-ring and inter-ring trajectories of the microfibril angle in the S2 layer of the tracheid wall. Those trajectories describe the fluctuations of the S2 microfibril angle, respectively, from earlywood to latewood within rings and from pith to bark among rings. Using the cross-field pit apertures, intra-ring measures of microfibril angle were made at 11 equally-spaced sampling sites over each of 8 growth rings, following an 11 × 8 doubly repeated measures design with the tree as the 'subject' on which repeated measures were made. All the intra-ring trajectories of microfibril angle decreased linearly from earlywood to latewood, whereas the inter-ring trajectories showed significant year effects. Both types of trajectories are significantly affected by the growth rate after first thinning, as the fast-grown spruces showed a systematically larger microfibril angle and a mean microfibril angle of 290 compared to 21 0 for the slow-grown spruces. Thus, lower tensile and tear strengths of tracheids as well as some modifications of the mechanical properties of solid wood and paper can be expected from Norway spruces growing faster than 2.2 cm/year in circumference. |
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| **Author(s):** | M. P. Denne; M. D. Hale |
| **Title:** | **Cell Wall and Lumen Percentages in Relation to Wood Density of Nothofagus Nervosa** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 23-36 |
| **Keywords:** | cell type percentages; wood density; rauli; Nothofagus procera; Nothofagus aipina; specific gravity |
| **Abstract:** | Cell wall and lumen percentages were determined for vessels, fibres and rays from 10 trees of Nothofagus nervosa (rauli), and analysed in relation to ring number from the pith, ring width, and density. Increase in density across the juvenile wood was mainly associated with an increase in fibre wall %, which outbalanced a simultaneous increase in vessel lumen %. Decrease in density across the mature wood was associated with changes in both fibre wall and total lumen percentages. Though density varied only slightly with ring width, this was accompanied by appreciable changes in percentages of different cell types. These trends in the wall and lumen percentages of the various cell types suggest that some physical properties may vary more within the tree (or with growth rate) than is suggested by the limited variation in density that is found in rauli. There were significant between-tree variations in both density and cell types, indicating the possibility of selection for either at an early stage of tree growth. |
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| **Author(s):** | R.D. Barnes; R.A. Plumptre; T.K. Quilter; A.R. Morris; J. Burley; E.R. Palmer |
| **Title:** | **The Use of Stem Dissection to Sample Trees of Different Ages for Determining Pulping Properties of Tropical Pines** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 37-43 |
| **Keywords:** | Tropical pines; wood density; pulping properties; Pinuspatula; Pinus elliottii |
| **Abstract:** | A study was undertaken to determine the effects of rotation age and site altitude on the quality of unbleached kraft pulp made from Pinus elliottii and P. patula grown in the Usutu Forest, Swaziland. Stands well beyond the current rotation age of 18 years were selected at site altitudes of 850, 1200 and 1450 metres. From each tree felled, sample discs were removed to represent the tree as it was at 11, 18 and 25 years of age. This was done by counting back the appropriate number of growth rings for the required age at each sampling point up the stem and paring them off the disc. Wood density, alpha-cellulose, lignin and ethanol-benzene-soluble extractives were measured in the wood and tear and tensile indices on the pulp. The patterns of variation with age were as expected from previous work where whole trees were sampled for each age class except for the ethanol-benzene solubles which showed a decrease with age for the dissected tree. It is concluded that the technique reduces the logistical problems of sampling separate trees to represent different ages from different sites; it controls within-site genetic and environmental variation and it is suitable to determine variation of pulping properties with age and site. |
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| **Author(s):** | Editors IAWA Journal |
| **Title:** | **Book Announcements** |
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| **Author(s):** | Willie Abasolo; Masato Yoshida; Hiroyuki Yamamoto; Takashi Okuyama |
| **Title:** | **Internal Stress Generation in Rattan Canes** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 45-58 |
| **Keywords:** | released strain; fiber ratio; internal stress; Calamus merrillii Becc; microfibril angle (MFA); lignin content |
| **Abstract:** | Internal stress development was investigated in rattan canes (Calamus merrillii Becc.) following the procedures used in trees. Measurements showed that longitudinal compressive stresses existed at the periphery while longitudinal tensile stresses existed at the core. Such stresses originated from the fibers. Fiber MFA was observed to be beyond 20" and the lignin content was above 30%. Considering its similarities to compression wood tracheids, it was assumed that the rattan fibers generated longitudinal compressive stress. The amount of stress varied from base to top and from periphery to core because of the variation in the proportion of fibers along these points. This is why the longitudinal compressive stress that was generated at the base was higher than at the top and high longitudinal compressive stress was developed at the periphery. As a response to this high peripheral stress, longitudinal tensile stress was induced at the core. |
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| **Author(s):** | Peter Gasson; Polly Webley |
| **Title:** | **Wood Anatomy of Exostyles Venusta (Swartzieae, Papilionoideae, Leguminosae)** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 59-66 |
| **Keywords:** | Sophoreae; Exostyles; Swartzieae |
| **Abstract:** | The genus Exostyles consists of two to three species from Brazil. This paper describes the wood of E. venusta Schott, completing generic coverage of the wood anatomy of the tribe Swartzieae as defined by Cowan (1981). Small twigs from herbarium sheets of E. glabra and E. amazonica (labelled E. venusta) were also examined. Exostyles wood anatomy is compared with that of the other genera in the tribes Swartzieae (Gasson 1996) and Sophoreae (Gasson 1994; Fujii et al. 1994), and is very similar to three closely related genera of Swartzieae, Zollernia, Harleyodendron and Lecointea. |
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| **Author(s):** | Roland R. Roland R.Dute; Kathy M. Duncan; Brandon Duke |
| **Title:** | **Tyloses in Abscission Scars of Loblolly Pinel** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 67-74 |
| **Keywords:** | Pinus; tyloses; cladoptosis; abscission |
| **Abstract:** | During a study of fascicle abscission in Pinus taeda L., tyloses were observed to occlude tracheids of both proximal and distal abscission scars. The tyloses represent the protrusion of ray parenchyma cells into tracheid lumens. Multiple tyloses often arise from a given parenchyma cell and can enter multiple tracheids. Tyloses occur as part of an abscission process that also includes the presence of Type II cells (programmed to enlarge during abscission in the presence of ethylene) and rupture of tracheids-features common to abscission in angiosperms. |
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| **Author(s):** | Helga Lindorf |
| **Title:** | **Perforated Ray Cells in Saracha Quitensis (Solanaceae)** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 75-77 |
| **Keywords:** | Saracha quitensis; Solanaceae; Perforated ray cells |
| **Abstract:** | This work reports perforated ray cells in the stem wood of Saracha quitensis (Solanaceae), In this species the perforated ray cells were found either isolated or together in groups of 2 to 4, localised mainly on the ends of multi seriate rays, though they may also be observed in the ray body. They are generally larger than other ray cells, with simple perforations, as in vessel elements, located in both radial and tangential walls. |
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| **Author(s):** | Kishore S. Rajput; K. S. Rao |
| **Title:** | **Nucleated Wood Fibres in Some Members of Combretaceae** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 79-83 |
| **Keywords:** | Calycopteris; Quisqualis; Anogeissus; Nucleated fibres; Terminalia; Combretum |
| **Abstract:** | The wood fibres retain their living protoplast in eleven species of five genera of the Combretaceae. Among the species studied, those of Anogeissus and Terminalia are trees while those of Calycopteris, Combretum and Quisqualis are large scandent shrubs. Living fibres with oval to oblong or fusiform shaped nuclei were found among all the species but their occurrence is more persistent in trees than in scandent species. The fibres are septate, thick-walled with narrow lumen and possess slitlike simple pits. In Combretum ovalifolium prismatic crystals frequently co-occur with the nucleus in the same compartment of the fibres. The possible significance of living fibres is discussed. |
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| **Author(s):** | Jorgo Richter; Pieter Baas |
| **Title:** | **Review** |
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| **Author(s):** | K. S. Rao; Kishore S. Rajput |
| **Title:** | **Seasonal Behaviour of Vascular Cambium in Teak (Tectona Grandis) Growing in Moist Deciduous and Dry Deciduous Forests** |
| **Source:** | IAWA Journal, Volume 20, Issue 1 |
| **Publication Year:** | 1999 |
| **Pages:** | 85-93 |
| **Keywords:** | xylem; Vascular cambium; Tectona grandis; phloem |
| **Abstract:** | Seasonal behaviour of vascular cambium in Tectona grandis L. f. growing in Moist Deciduous Forests (MDF) and Dry Deciduous Forests (DDF) of Gujarat State in Western India was studied for one annual cycle. In both the forests active cambial cell division and simultaneous differentiation of xylem and phloem started in June when the dormant shoot buds opened. In MDF cambial cell activity reached its peak in August-September and ceased in October; in DDF it ceased in November after reaching a peak in July-August. Maximum radial growth in trees of both forests occurred during the monsoon period. In both forests, phloem differentiation ceased before xylem differentiation. During dry months and the leafless periods the cambium remained dormant. Xylem mother cells next to the mature xylem in MDF underwent differentiation into xylem elements following the onset of periclinal divisions in March. In both forests, the seasonal anatomical changes associated with the cambium closely followed the phenology of the tree and local climatic conditions. |
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| **Title:** | **Wood Anatomy News** |
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