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| **Author(s):** | Fritz H. Schweingruber; Alan Crivellaro |
| **Title:** | **Letter to the Editor – Comments on the IAWA Hardwood List now available on the web** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 369-371 |
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| **Abstract:** |  |
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| **Author(s):** | H. Aiso; F. Ishiguri; T. Ohkubo; S. Yokota |
| **Title:** | **Tension wood-like reaction wood in vessel-less *Tetracentron sinense*** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 372-382 |
| **Keywords:** | microfibrillar angle; Mäule reaction; tracheids; phloroglucinol-HCl reaction; Lignin |
| **Abstract:** | The objective of this study is to clarify the anatomical characteristics and lignin distribution of reaction wood in a vessel-less angiosperm species, *Tetracentron sinense* Oliv. Sample disks (1 cm in thickness) were collected from three different positions of a *Tetracentron sinense* tree. Cell morphologies, the microfibril angle (MFA) in the S2 layer, lignin distribution, and lignin content were measured. There was neither a gelatinous (G-)layer nor an S3 layer on the upper side of inclined samples. However, the secondary wall of the normal tracheids was only weakly stained by Mäule and phloroglucinol-HCl. MFA in the S2 layer and lignin content decreased on the upper side of inclined samples. This qualifies the reaction wood of *Tetracentron* as “tension wood-like”. The so-called “unusual tracheids”, typical for the wood of *Tetracentron*, showed weaker changes in their anatomical and chemical characteristics in reaction wood than normal tracheids, indicating their special function in water transport. It is hypothesized that vessel-less angiosperms rich in syringyl units in their lignin, produce tension wood-like reaction wood on the upper side of inclined stems or branches, with lower MFA and lignin content in their normal tracheid walls, irrespective of whether a typical G-layer is formed or not. |
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| **Author(s):** | Jong Sik Kim; Geoffrey Daniel |
| **Title:** | **Variations in cell wall ultrastructure and chemistry in cell types of earlywood and latewood in English oak (*Quercus robur*)** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 383-401 |
| **Keywords:** | parenchyma cell; xylan; Libriform fiber; vasicentric tracheids; mannan; lignin; vessel |
| **Abstract:** | Although there is considerable information on anatomy and gross chemistry of oak wood, little is known on the ultrastructure and chemistry at the individual cell wall level. In particular, differences in ultrastructure and chemistry within the same cell type between earlywood (EW) and latewood (LW) are poorly understood. This study investigated the ultrastructure and chemistry of (vasicentric) tracheids, vessels, (libriform) fibers and axial/ray parenchyma cells of English oak xylem (*Quercus robur* L.) using light-, fluorescence- and transmission electron microscopy combined with histo/cytochemistry and immunohisto/ cytochemistry. EW tracheids showed several differences from LW tracheids including thinner cell walls, wider middle lamella cell corner (MLcc) regions and lesser amounts of mannan epitopes. Fibers showed thicker cell walls and higher amounts of mannan epitopes than tracheids. EW vessels were rich in guaiacyl (G) lignin with a characteristic non-layered cell wall organization (absence of S1–3 layers), whereas LW vessels were rich in syringyl (S) lignin with a three layered cell wall structure (S1–3 layers). Formation of a highly lignified and wide protective layer (PL) inside axial/ray parenchyma cells was detected only in EW. Distribution of mannan epitopes varied greatly between cell types and between EW and LW, whereas distribution of xylan epitopes was almost identical in all cell types within a growth ring. Together, this study demonstrates that there are great variations in ultrastructure and chemistry of cell walls within a single growth ring of English oak xylem. |
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| **Author(s):** | Jong Sik Kim; Geoffrey Daniel |
| **Title:** | **Distribution of phenolic compounds, pectins and hemicelluloses in mature pit membranes and its variation between pit types in English oak xylem (*Quercus robur*)** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 402-419 |
| **Keywords:** | half-bordered pit; non-cellulosic polysaccharide; pit membrane chemistry; immunocytochemistry; simple pit; Bordered pit; xyloglucan; heteromannan |
| **Abstract:** | Although there is considerable information on the chemistry of bordered intervessel pit membranes, little is known on the pit membrane chemistry of other pit types in hardwoods. This study investigated distribution of phenolic compounds, pectins and hemicelluloses in different mature pit membranes of English oak xylem using transmission electron microscopy coupled with cytochemistry and immunocytochemistry. Mature bordered intertracheid (vasicentric)- and tracheid-vessel pits showed presence of xyloglucan and heteromannan (hemicelluloses) epitopes across the pit membrane (except for the annulus regions) with differences in amounts of epitopes between earlywood (EW) and latewood (LW). In contrast, pectin epitopes were detected only in the annulus regions of pit membranes. Unlike bordered pits, half-bordered (tracheary-parenchyma pits) and simple (parenchyma pits) pit membranes were rich in pectin epitopes but lacked heteromannan epitopes, indicating difference in pit membrane chemistry between pit types. Distribution of phenolic compounds also differed between pit types and between EW and LW. LW also showed great variations in distribution of phenolic compounds between vessels. Together, this study demonstrates that there are great variations in pit membrane chemistry between pit types and between EW and LW in English oak xylem. |
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| **Author(s):** | Maria C.J. Bergo; Tereza C.M. Pastore; Vera T.R. Coradin; Alex C. Wiedenhoeft; Jez W.B. Braga |
| **Title:** | **NIRS identification of *Swietenia macrophylla* is robust across specimens from 27 countries** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 420-430 |
| **Keywords:** | Swietenia macrophylla; Micropholis melinoniana; Cedrela odorata; provenance; Near infrared spectroscopy; Carapa guianensis |
| **Abstract:** | Big-leaf mahogany is the world’s most valuable widely traded tropical timber species and Near Infrared Spectroscopy (NIRS) has been applied as a tool for discriminating its wood from similar species using multivariate analysis. In this study four look-alike timbers of *Swietenia macrophylla* (mahogany or big-leaf mahogany), *Carapa guianensis* (crabwood), *Cedrela odorata* (cedar or cedro) and *Micropholis melinoniana* (curupixá) have been successfully discriminated using NIRS and Partial Least Squares for Discriminant Analysis using solid block and milled samples. Species identification models identified 155 samples of *S. macrophylla* from 27 countries with a correct classification rate higher than 96.8%. For these specimens, the NIRS spectrum variation was more powerful for species identification than for determining provenance of *S. macrophylla* at the country level. |
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| **Author(s):** | Kishore S. Rajput; Himansu Baijnath |
| **Title:** | **Stem anatomy of some species of *Passiflora* (Passifloraceae)** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 431-443 |
| **Keywords:** | fibriform vessel elements; Cambial variants; lianas, aggregate rays; phloem wedges; lobed stem |
| **Abstract:** | The stem anatomy of *Passiflora edulis, P. foetida, P. suberosa, P. subpeltata*, and *P. vesicaria* was studied in samples collected in Durban (KwaZulu-Natal Province, South Africa) and Baroda (Vadodara, Gujarat State, India). Radial stem growth in all the species is realized by a single, bidirectional vascular cambium. However, unequal activity in small segments of the cambial cylinder results in a lobed stem outline in *P. foetida var. ellisonii*, and a furrowed xylem cylinder in *P. edulis f. edulis* and *P. vesicaria var. vesicaria*. In *P. subpeltata* and *P. edulis* f. *flavicarpa* the xylem remains cylindrical in outline. In all the species investigated, secondary xylem is diffuse-porous with growth rings indistinct or absent. In transverse view, vessels are round to oval with different diameter categories, including very narrow fibriform vessels intermixed. In *P. edulis* f. *edulis*, stems are lobed due to the unidirectional activity of the cambium in small segments. Rays are mostly both narrow (1–3-seriate) and wide (multiseriate). The latter often become aggregate at some distance from the pith. |
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| **Author(s):** | Anne-Laure Decombeix; Edith L. Taylor; Thomas N. Taylor |
| **Title:** | **Bark anatomy of Late Permian glossopterid trees from Antarctica** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 444-458 |
| **Keywords:** | secondary xylem; Paleobotany, Paleozoic; secondary phloem; high latitude; rhytidome; Glossopteridales |
| **Abstract:** | The Glossopteridales are an extinct group of seed plants that dominated Gondwanan floras during the Permian. Their remains are found across a wide range of habitats and paleolatitudes, and it is particularly interesting to understand the anatomical characteristics that might have enabled such an extensive distribution. Here, we document for the first time the bark anatomy of high-latitude glossopteridalean trees using peels and thin sections made from a Late Permian trunk from Skaar Ridge, Antarctica. The bark is 3 cm thick. The secondary phloem is composed of sieve cells, axial and ray parenchyma, and fibers arranged in discontinuous unicellular tangential layers. The outer bark is a rhytidome, with numerous alternating layers of periderm and non-conducting secondary phloem showing some proliferation of the axial parenchyma. Successive periderms mostly run parallel to the cambium, with some longitudinal undulation and rare connections between two periderms. A similar anatomy was observed in bark fragments found isolated in the matrix or closely associated with large glossopterid stems or roots. The anatomy of the Skaar Ridge specimens shows that Antarctic Glossopteridales had a relatively thick, probably stringy bark. The retention of a significant amount of insulating dead bark tissue on the trunk likely provided protection of the cambium, conducting secondary phloem, and potential latent buds against biotic and abiotic environmental hazards (fire, frost, scalding, insects, etc.) and may have contributed to the extensive paleolatitudinal distribution of the Glossopteridales during the Permian. |
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| **Author(s):** | Dimitra Mantzouka; Vasileios Karakitsios; Jakub Sakala; Elisabeth A. Wheeler |
| **Title:** | **Using idioblasts to group *Laurinoxylon* species: case study from the Oligo-Miocene of Europe** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 459-488 |
| **Keywords:** | Cinnamomoxylon; Hungary; Lesbos Island (Greece); Czech Republic; UNESCO Global Geoparks; oil and/or mucilage cells; Lauraceae, fossil wood anatomy |
| **Abstract:** | Several specimens of Lauraceae fossil wood from the Cenozoic of Greece (southern part of Lesbos), the Czech Republic (Kadaň-Zadní Vrch Hill and Jáchymov), and Hungary (Ipolytarnóc) were studied. When considering whether they belonged to the speciose fossil wood genus *Laurinoxylon*, we reviewed the literature and data from InsideWood on fossil and modern woods. As a result, we propose criteria for excluding a fossil Lauraceae wood from *Laurinoxylon* and list the species that should be excluded from this genus. The criteria (filters) proposed to exclude a genus from having relationships with *Laurinoxylon* are: A. Axial parenchyma features: A1. Marginal axial parenchyma, A2. Aliform to aliform-confluent paratracheal parenchyma. B. Ray features: B1. Rays higher than 1 mm, B2. Exclusively homocellular rays, B3. Rays more than 5 cells wide, B4. Rays storied. C. Porosity features: Ring-porous. D. Idioblasts: Absence of idioblasts. Based on the distribution of idioblasts, we recognize four groups in *Laurinoxylon* (*Type 1* - with idioblasts associated only with ray parenchyma cells, *Type 2a* - with idioblasts associated with both ray and axial parenchyma, *Type 2b* - with idioblasts associated both with rays and present among the fibres, and *Type 3* - with idioblasts associated with ray and axial parenchyma and also among the fibres) and list the extant genera with features of those groups. Such grouping helps with interpreting the relationships of fossil lauraceous woods with extant genera. We discuss the Oligocene–Miocene European species that belong to these *Laurinoxylon* groups, noting that some warrant reassignment to different genera or even families. Future studies are needed to determine whether new genera should be established to accommodate these species. We propose the new combination *Cinnamomoxylon variabile* (Privé-Gill & Pelletier) Mantzouka, Karakitsios, Sakala & Wheeler. |
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| **Author(s):** | Rita Scheel-Ybert |
| **Title:** | **Charcoal collections of the world** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 489-505 |
| **Keywords:** | wood anatomy; Anthracology, charcoal analysis; collections; wood identification |
| **Abstract:** | Charcoal reference collections are very important for identifying unknown charcoal specimens in different contexts (palaeoecological, archaeological, environmental and others) and form an integral part of anthracological studies, which can provide crucial information for researchers of different expertise, as wood anatomy, archaeology, palaeobotany, forestry, forensics, etc. A first inventory on charcoal collections maintained by scientific institutions or private individuals around the world revealed 53 charcoal collections in five continents. There is a high concentration of collections and specimens in Europe, reflecting a better established and longer tradition of charcoal identification in temperate and mediterranean regions. However, research seems to be firmly advancing in other parts of the world, especially in the tropics, where important collections are being established. The great increase observed in the number of existing charcoal collections and their geographical spread in the last years attest to their importance, as well as to the vigour of anthracology in its various approaches. The wood anatomical community is called upon to help fill gaps in this first inventory of charcoal collections. |
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| **Author(s):** | Jean-Claude Cerre |
| **Title:** | **Technical Note – Incident light microphotography at high depth of focus** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 506-510 |
| **Keywords:** | wood surface; vessel perforation; Three-dimensional wood structure |
| **Abstract:** | A new method for stacked microphotography of 3D wood structures is described and illustrated with a practical protocol for visualizing the multiple perforation plates of *Goupia glabra* as seen in transverse surfaces. |
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| **Author(s):** | Pieter Baas |
| **Title:** | **Secondary Xylem Biology. Origins, Functions, and Applications. Yoon Soo Kim, Ryo Funada, and Adya P. Singh (eds.), xx + 397 pp., illus., 2016. Elsevier, Academic Press, ISBN 978-0-12-802185-9 (paperback). Price EUR 61.16** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 511-512 |
| **Keywords:** |  |
| **Abstract:** |  |
| **DOI:** | [10.1163/22941932-201601150](http://dx.doi.org/10.1163/22941932-201601150) |

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| **Author(s):** | Pieter Baas |
| **Title:** | **Identification Manual of Endangered and Precious Woods in Common Trade (in Chinese). Yafang Yin and Xiaomei Jiang (eds.), Feng Xu, Xiaomiao Sun, and Lichao Jiao (assoc. eds.), 171 pp., colour illus., 2015** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 512-513 |
| **Keywords:** |  |
| **Abstract:** |  |
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| **Author(s):** | Editors IAWA Journal |
| **Title:** | **ERRATUM IAWA JOURNAL 27(4)** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
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| **Author(s):** | Editors IAWA Journal |
| **Title:** | **WOOD ANATOMY NEWS** |
| **Source:** | IAWA Journal, Volume 37, Issue 3 |
| **Publication Year:** | 2016 |
| **Pages:** | 514-515 |
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