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| **Author(s):** | Marco Fioravanti; Giuseppina Di Giulio; Giovanni Signorini; Gabriele Rossi Rognoni; Nicola Sodini; Giuliana Tromba and Franco Zanini |
| **Title:** | **Non-invasive wood identification of historical musical bows** |
| **Source:** | IAWA Journal, Volume 38, Issue 3 |
| **Publication Year:** | 2017 |
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| **Keywords:** | Cultural heritage; musical instruments; Manilkara sp; synchrotron light X-ray μCT; Caesalpinia echinata; Brosimum guianense |
| **Abstract:** | We identified the wood of the sticks of eight bows in the historical collection of musical instruments in the Galleria dell’ Accademia in Florence. Wood identification was carried out non-invasively (i.e., without sampling wood from the original objects), because the removal of samples from fine musical instruments will affect their aesthetic integrity and/or functional quality. Identification attempts using reflected light microscopy of wood surfaces, gave only partial results due to the poor quality of the surfaces and the particular geometry of the sticks that does not have any transverse surface. Application of Synchrotron light X-ray microtomography (µCT) in phase-contrast mode to the whole sticks allowed us to obtain stacks of transverse-sectional images that, processed as virtual volumes, revealed several anatomical features. With µCT it was possible to identify three bows as Brosimum guianense (Moraceae), one bow as Caesalpinia echinata (Caesalpiniaceae), and four bows as Manilkara sp. (Sapotaceae). |
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| **Author(s):** | Neda Lotfiomran and Michael Köhl |
| **Title:** | **Retrospective analysis of growth A contribution to sustainable forest management in the tropics** |
| **Source:** | IAWA Journal, Volume 38, Issue 3 |
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| **Keywords:** | ring boundaries; tree rings; tropical forests; Growth dynamics; Suriname |
| **Abstract:** | Reliable information on tree growth is a prerequisite for sustainable forest management (SFM). However, in tropical forests its implementation is often hampered by insufficient knowledge of the growth dynamics of trees. Although tree ring analysis of tropical trees has a long history, its application for SFM has only recently been considered. In the current study, we illustrate both the potentials and limitations of a retrospective growth assessment by tree ring analysis under the prevailing tropical conditions in a Surinamese rain forest. For this purpose, 38 commercial tree species were screened and grouped into three categories according to the visibility of their tree ring boundaries: (I) tree rings absent or indistinct, (II) distinct but partially vague tree rings which enable approximate age estimation, (III) very distinct tree rings. In 22 out of 38 commercial tree species distinct to very distinct tree ring boundaries could be identified. The anatomy of tree ring boundaries was described following Worbes and Fichtler (2010). Four species with distinct growth rings, Cedrela odorata, Hymenaea courbaril, Pithecellobium corymbosum and Goupia glabra, were studied in greater detail. Time-series analysis was used to characterise their radial growth. From the tree ring width, the annual diameter increment and cumulative diameter growth were calculated to find long-term growth patterns. Pithecellobium corymbosum and partially Hymenaea courbaril followed a typical S-shaped growth curve. By contrast, Goupia glabra and Cedrela odorata did not exhibit an age-related decrease of growth, but showed a constant linear growth over their entire life span. If based on more sample trees, such data can provide target-oriented information for improving SFM in tropical forests. |
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| **Author(s):** | D.W. Woodcock; H.W. Meyer and Y. Prado |
| **Title:** | **The Piedra Chamana fossil woods (Eocene, Peru)** |
| **Source:** | IAWA Journal, Volume 38, Issue 3 |
| **Publication Year:** | 2017 |
| **Pages:** | 313 – 365 |
| **Keywords:** | Fossil forest; fossil leaves; Peruvian Andes; wood anatomy; Sexi |
| **Abstract:** | The fossil woods and leaves of the Fossil Forest Piedra Chamana represent a diverse assemblage of plants dating to 39 Ma (late Middle Eocene). The fossils are preserved in an ashfall and overlying lahar deposits near the small village of Sexi in the northern Peruvian Andes (central Cajamarca). The assemblage includes dicot wood types and leaf morphotypes, as well as a diversity of monocot material. The ~30 dicot wood types are referred to the families Acanthaceae, Anacardiaceae, Apocynaceae, Combretaceae, Cordiaceae, Dipterocarpaceae, Euphorbiaceae, Fabaceae, Lechythidaceae, Lythraceae, Malvaceae, Melastomataceae, Muntingiaceae, Rubiaceae, Rutaceae, and Sapindaceae. Described herein are descriptions of the first 17 wood types that have been assigned to the families Acanthaceae through Lythraceae; descriptions of the additional wood types will appear in a later paper. The paleovegetation can be characterized as lowland tropical forest with a dry aspect based on preliminary analysis of floristic affinities and wood anatomical characteristics of the fossils. |
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| **Author(s):** | Nathan A. Jud and Jeremy I. Dunham |
| **Title:** | **Fossil woods from the Cenozoic of Panama (Azuero Peninsula) reveal an ancient neotropical rainforest** |
| **Source:** | IAWA Journal, Volume 38, Issue 3 |
| **Publication Year:** | 2017 |
| **Pages:** | 366 – S2 |
| **Keywords:** | Moraceae; Rare Earth Elements; Ficus; Central America; Lauraceae; fossil wood anatomy; tropical rainforest |
| **Abstract:** |  Silicified woods from near the town of Ocú on the Azuero Peninsula, Panama were first reported by Stern and Eyde in 1963; however, the significance of these fossils has been largely overlooked. Well-characterized fossil floras from Central America can be used to test hypotheses related to the historical biogeography and paleoclimate of the Neotropics. We describe 10 new wood types and one palm based on 22 samples from Oligo-Miocene deposits. Affinities at the family/order level include Fabaceae, Lauraceae, Moraceae, Sapotaceae, Euphorbiaceae, Arecaceae, Sapindales, Ericales, and Humiriaceae. The fossil woods are fragmentary and have not been found in-place, but the size and angularity of the specimens suggests minimal transport from the site of growth. We compared these woods with calcareous woods from the Lower Miocene Cucaracha Formation and silicified woods from the upper Miocene Alajuela Formation using Rare Earth Element (REE) analysis to test the hypothesis that the Ocú woods were preserved under uniform conditions and not reworked. Although the results were ambiguous with respect to the original hypothesis, we note that the REE concentrations in silicified woods are much lower than in calcareous woods. We used comparative analysis of wood anatomical features to draw conclusions about the paleoclimate from the fossil flora. All the dicot woods are diffuse porous and none have distinct growth rings; some have very wide vessels at low frequencies. These features are typical of canopy trees in tropical lowland forests. Nonmetric multidimensional scaling of wood anatomical characters from a variety of communities and ecological categories showed that the anatomy of the Ocú woods is most similar to that found in tropical rainforests. Based on the combination of taxonomic identity and functional anatomy, we interpret these fossils as evidence for humid to perhumid megathermal climate in Panama during the late Paleogene-early Neogene. |
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