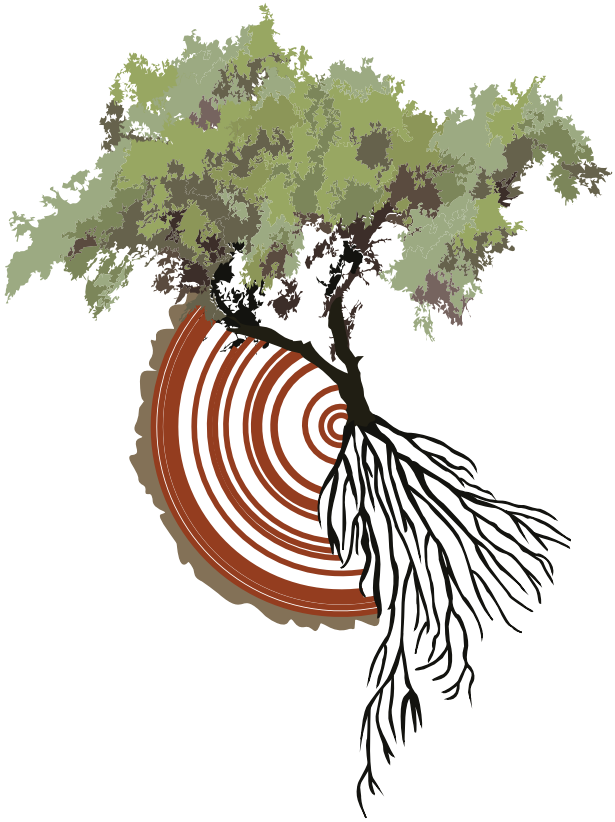
AMERIDENDRO 2016

Third American Dendrochronology Conference

Monday March 28 - Friday April 1, 2016, Mendoza, Argentina



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old for *Q. grandiflora* at SP state and 10 kg.year^{-1} at 38 years old for MS state; *P. torta* was of 6 kg.year^{-1} at 55 years and *O. pulchella* was 17 kg.year^{-1} at 49 years.

High sensitivity of broadleaf trees to water availability in northeastern US

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Isotopes in Dendrochronology: ISO-P-02 - Main Hall

Temperate deciduous forests of eastern US provide goods and services to millions of people and play a vital role in the terrestrial carbon and hydrological cycles. However, ongoing climate change and increased in CO_2 concentration (ca) are expected to alter growth and gas exchange of trees, and ultimately forest productivity. Still, the magnitude of these effects is unclear. A better comprehension of the species–specific responses to environmental changes will better inform models and managers on the vulnerability and resiliency of these forests. We combined tree-ring analysis with $\delta^{13}C$ and $\delta^{18}O$ measurements to investigate growth and physiological responses of *Quercus rubra* and *Liriodendron tulipifera* in northeastern US to changes in water availability and ca for the period 1950–2014. We found very strong correlations between summer climatic water balance (June–August) and isotopic tree-ring series for $\delta^{13}C$ (r = -0.65 and -0.73), and $\delta^{18}O$ (r = -0.59 and -0.70), for *Q. rubra* and *L. tulipifera*, respectively. In contrast, tree-ring width was less sensitive to summer water availability (r = 0.33–0.39). Prior to the mid 1980s, low water availability resulted in low stomatal conductance, photosynthesis, and growth. Since that period, pluvial conditions occurring in northeastern US have increased stomatal conductance, carbon uptake, and growth of both species. Further, stronger spatial correlations were found between climate data with tree-ring isotopes than with tree-ring width and the geographical area of the observed d18O-precipitation response (i.e. the area over which correlations are > 0.5) covers most of the northeastern US. Given the good fit between the isotopic time series and water availability, the robustness of the hydroclimatic reconstructions in this region could be improved considerably with further isotopic research. Overall, the results indicate that stable isotopes yield valuable climatic and physiological information that could be undetected when using solely tree-ring width.

Growth, phenology and physiological responses of four Caatinga semi-arid climate tree species

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Tropical Dendrochronology: TRO-P-08 - Main Hall

The growth of the trunk and metabolic processes of Caatinga´s species *Aspidosperma pyrifolium* Mart. (Pereiro), *Poincianella pyramidalis* (Tul.) L. P. Queiroz (Catingueira), *Commiphora leptophoeus* (Mart.) J. B. Gillett (Amburana) and *Ziziphus joazeiro* Mart. (Juazeiro), each six trees, were studied during 16 months through dendrometers, phenology, wood anatomy, water potential (Ψw) and relative water content (RWC). In the study site dry season were recorded from November to March (mean 9 mm), and the rainy season between April to October (mean 70 mm). All species showed increases in trunks during April-July (rainy season) and wilt during August-March (dry period). The correlation of Pereiro measurements (widths and increment) with the monthly rainfall was 0.823, showing its sensitivity to climate. Similar result for Catingueira, with a month of delay. The Juazeiro and Amburana had lower and later increments. Change of the leaves in all species occurred during the dry season, varying in intensity and representing the adaptation of these plantas to semi-arid climate. Even the Juazeiro show it between December and January (dry season). The Amburana remained the most months with no or very few leaves. The Catingueira and Pereiro had Ψw and RWC varying according to the reduction in soil water availability, anisohydric behavior species. The Juazeiro, although reduced Ψw in response to seasonality, RWC kept around 80%, which represents a minor loss of cellular turgor in dry period. The Amburana, in remained periods with leaves, has high .w and RWC values (around 80%), showing an efficient mechanism for maintaining tissue turgor, with less variation in response to seasonality. All species show growth layers in response to the semi-arid climate, indicating its use in dendrochronology and environmental studies.

Dendroecology of *Aspidosperma polyneuron* Müll. Arg. (APOCYNACEAE) trees in two different geomorphological growth conditions in Atlantic forests, Paraná State, Brazil.

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Dendroecology: ECO-P-17 - Main Hall

Distinct annual tree rings may provide important and reliable records regarding climate and growth conditions of the plant, and these decodified data are essential for climatic and environmental reconstructions for a particular region. However, the lack of environmental records and sufficiently long-lived tree species with reliable annual growth rings might limit these studies. *Aspidosperma polyneuron* Müll. Arg (Apocynaceae) popularly known as “peroba rosa”, was heavily exploited during the expansion and the colonization cycle of the interior of Paraná State, having its population drastically reduced in extensive areas of seasonal semideciduous forests. However, due to the difficulty of accessing some regions, large individual tree species were preserved. Recently, following the construction of a hydroelectric plant (Mauá Hydroelectric, Municipality: Telemaco Borba - 24°19'28''S, 50°36'59'' W), some portions of these remaining forests were removed. Thus, a total of forty large adult individuals were cut and trunk disks were obtained from selected