53rd ATBC 2016

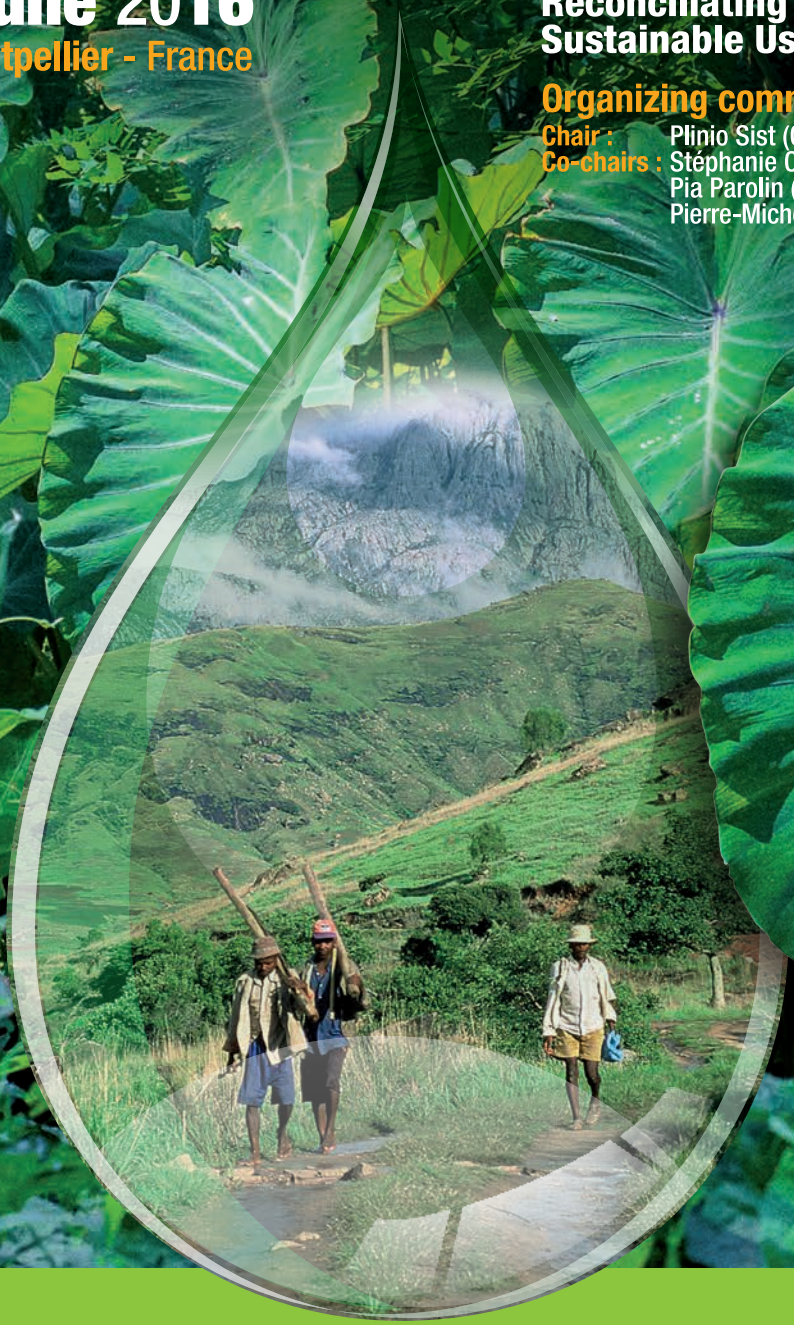
Annual Meeting of the Association for Tropical Biology and Conservation

19-23 June 2016
Le Corum, Montpellier - France

Tropical Ecology and Society
Reconciliating Conservation and Sustainable Use of Biodiversity

Organizing committee :

Chair : Plinio Sist (CIRAD)
Co-chairs : Stéphanie Carrière (IRD)
Pia Parolin (INRA)
Pierre-Michel Forget (MNHN, CNRS-INEE)



PROGRAM & ABSTRACTS

www.atbc2016.org

Association for Tropical Biology and Conservation

cirad

IRD Institut de recherche pour le développement

INRA SCIENCE & IMPACT

MUSÉUM NATIONAL D'HISTOIRE NATURELLE

cnrs

CIFOR

CONGRESS OFFICE
HOPSCOTCH CONGRÈS
23/25, rue Notre-Dame des Victoires
75002 Paris | France
www.hopscotchcongres.com

O9-07 – S9 *Retrospective analysis of the growth of trees from their anatomy and morphology (ragtag)*
Monday 20 June 20 / 11:00-15:30 – Antigone3

Retrospective analysis of plant architecture: an extended definition of dendrochronology

PATRICK HEURET[1], YVES CARAGLIO[2], SYLVIE SABATIER[2], DANIEL BARTHÉLÉMY[2], ERIC NICOLINI[3]
[1]INRA, UMR ECOFOG, KOUROU, French Guiana
[2]CIRAD, UMR AMAP, MONTPELLIER, France
[3]CIRAD, UMR AMAP, KOUROU, French Guiana

Accurate expertise on plant development in space and time is fundamental to underpin conservation and management practices. Considering that trees are long-life organisms with a complex structure, understanding the rules of tree development, from seedlings to adult trees and for a given environment, is a steep task. Compared to field monitoring, retrospective analysis of plant incremental development (RAPID), based on the observation of morpho-anatomical markers allows accessing the past dynamics of plant architecture on many varied plants. However, it is clear that besides this very general approach, works based on axis thickening (mainly trunk) and growth rings structure (GR) remain a broad majority and they are recognized as a full-fledged discipline called dendrochronology. Etymologically, dendrochronology is the science (-logia) of reading the time (khronos) in trees (dendron). Nevertheless, it is clear that this definition applies equally to the crown expansion and to the understanding of the primary growth, branching or flowering processes through the study of morphological or macro-anatomical markers. Moreover, it is important to note that theses approaches can be applied not only in trees, but also in perennial herbaceous herbs or mosses that conduce some authors to propose the term herbchronology. Without trying to change the term of dendrochronology, etymologically limited, but widely used and deeply rooted in the scientific landscape, we support the idea that it should be extended to all approaches concerning the RAPID. In this presentation, we'll depict a summary of methods that allow accessing the past development of plants considering four major processes, growth I and II, branching, and flowering whatever the biological life-form. We'll discuss the close connection amongst the nature of theses processes, their phenology and the resulting morpho-anatomical structure. Considering that plant form integrates multiple environmental factors but, also, internal trade-offs among functions, we argue that integrative studies considering jointly morpho-anatomical markers in a RAPID approach offers powerful insights for diverse fields including plant biology, ecology, conservation.

O9-08 – S9 *Retrospective analysis of the growth of trees from their anatomy and morphology (ragtag)*
Monday 20 June 20 / 11:00-15:30 – Antigone3

Cambial activity of selected tropical trees in relation to different stem sizes and climatic factors growing in Malaysian rain forest

KANG HAN WANG, MOHD ZAKI HAMZAH, MOHD NAZRE SALEH, RASMINA HALIS
Universiti Putra Malaysia, Forest Production, 43400, Serdang, Malaysia

Majority of previous studies on cambial activity are conducted using temperate trees and tropical trees growing in distinct dry and wet season. Similar studies on the activity of vascular cambium are relatively few for trees growing in tropical rain forest with a lack of clear seasonality. Relationship between tree diameter growth and climatic factors has been extensively studied through dendrochronological research which generally detects tree growth by minimising tree characteristics and assuming that climate-growth relationship is independent of tree size. Nevertheless, recent studies have proven that the sensitivity of tree growth rate to climatic factors is dependent on both tree species and size. Therefore, the present study focused on investigating seasonal cambial activity in selected tropical tree species growing under natural conditions with different stem diameters. The objectives of this study were to: (1) record annual cambial growth dynamics in tropical trees with variation in tree sizes and species, and (2) determine the influence of climatic factors (rainfall, temperature, relative humidity and vapour pressure deficit) on cambial activity of tropical trees with different life forms. Macaranga gigantea, Shorea leprosula, Shorea acuminata and Shorea parvifolia growing in lowland dipterocarp rainforest of west Peninsular Malaysia were selected for this study. Wood blocks consisting inner bark, cambium and outer sapwood were collected from the main trunks of the living trees. Sections were cut from epoxy-embedded wood block using sliding microtome. The anatomical characteristics of the cambial activity were determined by counting the number of cambial and enlarging zone cells. The cambial activity of the examined species is shown to have active and inactive growth periods. Climatic factors affect the cambial activity of tree differently, depending on the tree species and stem size within the species. Rainfall did not play an important role in determining tropical rainforest tree growth, except for S. parvifolia with larger stem size. Atmospheric water status such as vapour pressure deficit and relative humidity seem to affect more on tree growth in S. parvifolia and S. acuminata with larger stem sizes. This is believed to be different from other tropical trees growing in tropical seasonal forests with distinctive dry and wet seasons, where rainfall plays a significant role in tree growth.