



Linking carbon storage with functional diversity in tropical rainforest in the central Congo Basin

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This presentation will show an overview of results of the COBIMFO project (Congo basin integrated monitoring for forest carbon mitigation and biodiversity). In the framework of this project we have established 21 permanent 1 ha sampling plots in different forest types in the Yangambi reserve. This UNESCO Man and Biosphere reserve has an area of more than 6000 km² and is located in the heart of the Congo Basin near the Yangambi research station (DR Congo). Analysis of the inventory data of these plots revealed that carbon stocks in mature forests in this area of the Congo Basin are significantly lower (24%) than stocks recorded in the outer regions of the basin. These lower stocks are attributed to a lower maximal tree height (Kearsley et al. 2013).

In addition to the carbon inventories we collected leaf and wood samples on all species within 95% basal area of each of the Yangambi plots. A total of 995 individuals were sampled, covering 123 tree species. On the samples we measured 15 traits related to leaf and wood morphology and functioning. In the presented study, relationships between the observed functional diversity and biomass are analysed. One of the remarkable results of our analysis is that species with a high functional distinctiveness have a low contribution to the basal area and the carbon stocks. In contrast, species with a high contribution to the carbon stock have a low contribution to the functional diversity. Similar patterns have been observed elsewhere (e.g. Amazon basin), but are now for the first time confirmed for central African rainforest.

Finally, we also present the first results of an analysis of carbon stocks and functional diversity in tropical plantations from a unique 70-years old tree diversity experiment that was established during the colonial period at the Yangambi research station.

Kearsley, E., de Haulleville, T., Hufkens, K., Kidimbu, A., Toirambe, B., Baert, G., Huygens, D., Kebede, Y., Defourny, P., Bogaert, J., Beeckman, H., Steppe, K., Boeckx, P. & Verbeeck, H. (2013) Conventional tree height–diameter relationships significantly overestimate aboveground carbon stocks in the Central Congo Basin. *Nat Commun*, 4, 2269.