**Contributing to wood anatomical databases to improve species identification, phylogeny and functional trait research in Central Africa**

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Central African rainforests shelter a high number of woody species that are anatomically very different. Knowledge of taxon-specific wood anatomical features has proven indispensable for numerous scientific and non-scientific applications. The field of wood anatomy and identification has been drastically revolutionized by the development of internationally recognised lists of precisely illustrated microscopic features (e.g. IAWA Committee 1989), together with the launch of InsideWood, an on-line search database using these features to narrow down identification results (e.g. Wheeler 2011). However, despite these massive efforts, the anatomy of many species or even genera remains in the dark, especially in species-rich regions. Wood anatomy has been formally described for less than 25% of the Central African woody species (Hubau et al. 2012), the focus has been mainly on timber species and variations in wood anatomical structure remain to be explored.

Therefore, we are assembling a wood anatomical database of about 800 species covering the Guineo-Congolian region using material from InsideWood and the Tervuren xylarium. New descriptions will complete InsideWood. This database is compared to the trait database produced during the CoForChange project and a new phylogenetic database (Janssens & Hardy, unpublished data). As such, we present how large anatomical databases hold interesting perspectives for (i) wood and charcoal identification, (ii) exploring phylogenetic signals such as conservation and diversification of wood-anatomical features (iii) identifying the relationship between wood anatomical features and key functional traits of tropical trees. We discuss research potential, strengths and weaknesses for each type of application, as well as future steps and associated research projects.

**References**

IAWA Committee (1989). IAWA list of microscopic features for hardwood identification. *IAWA Journal* 10: 219–332.

Hubau, W. et al. (2012). Charcoal identification in species-rich biomes: A protocol for Central Africa optimised for the Mayumbe forest. *Review of Palaeobotany and Palynology* 171: 164-178.

Wheeler, E.A. (2011). InsideWood – a web resource for hardwood anatomy. *IAWA Journal* 32: 199-211.