Isotope Dendrochronology of African Mahogany (*Entandrophragma macrophyllum*) from the Central African Republic as a Hydroclimate Proxy

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Instrumental climate data from Central Africa is sparse. Thus, reliable proxies need to be developed to extend knowledge of climate into the past. Tree-rings have been widely used for this purpose in temperate regions, but less so in the tropics, mainly because annual ring formation cannot be assumed. This study analyzes oxygen isotope ($\delta^{18}O$) values of cellulose from the African Mahogany species *Entandrophragma macrophyllum* that was cored and collected from the Ngotto Forest, Central African Republic in 2012. *E. macrophyllum* is classified under the Meliaceae family, the most abundant family of trees in the Ngotto Forest, and is an important species for the local and global economy making it a good target for climate studies. A micro-milling approach was used to subsample each growth ring. Alpha cellulose was extracted, and samples were analyzed on a continuous flow isotope ratio mass spectrometer. $\delta^{18}O$ values showed clear seasonal cycles, with high $\delta^{18}O$ values at growth-ring boundaries and a seasonal amplitude of 3 to 4 ‰. Based on former dendroclimatology studies, it is expected that the $\delta^{18}O$ cellulose values of tropical trees should be predominately affected by the $\delta^{18}O$ value of precipitation. Since the $\delta^{18}O$ values of precipitation are tied to the ratio between evaporation and precipitation, and therefore precipitation volume, it is expected that there will be a correlation between precipitation and the oxygen isotopic composition of the cellulose. The $\delta^{18}O$ cellulose values from this study will be compared to precipitation data both collected in the field at the study site, as well as data collected by regional precipitation monitoring stations.