



## Comparison of belowground carbon allocation and carbon stocks between monodominant *Gilbertiodendron dewevrei* and species-rich *Scorodophloeus zenkeri* forests in the Yoko Reserve (Kisangani, DRC)

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*Gilbertiodendron dewevrei* is a tree species which extensively dominates large patches in Central Africa. These monodominant forests are often adjacent to higher-diversity forests like the *Scorodophloeus zenkeri* forests (called mixed forests). This combination of low and high diversity forests on otherwise similar edaphic and climatic conditions is ideal to study the impacts of those two contrasting and widespread forests on various carbon stocks and fluxes. Whereas carbon pools are increasingly documented for the forests located in the Central Congo Basin, much less is known about carbon fluxes. This is particularly the case for the Total Belowground Carbon Allocation to plant structures (TBCA), yet it represents a major ecosystem C flux.

In addition to estimates of aboveground (minimum diameter 10 cm) and soil (holorganic layers plus mineral soil down to 2m depth) carbon stocks, we measured soil respiration, fine root production (forest floor and 0-5 cm) and aboveground foliar litterfall during a one-year period in at least 106 subplots distributed over the two forests in the Yoko forest reserve close to Kisangani (Democratic Republic of Congo). TBCA was derived from the difference between annual rates of soil respiration and aboveground litterfall C, assuming the stocks of soil organic matter, roots, and litter are near steady state.

There were no significant ( $P < 0.05$ ) differences between forests for basal area ( $34.5 \pm 1.5$  vs  $37.9 \pm 0.9$  m<sup>2</sup> ha<sup>-1</sup>, mean  $\pm$  standard error, in the monodominant and mixed forests, respectively), aboveground C stock ( $265 \pm 12.0$  vs  $252 \pm 12.0$  Mg C ha<sup>-1</sup>), and litterfall C ( $4.66 \pm 0.2$  vs  $4.63 \pm 0.1$  Mg C ha<sup>-1</sup> yr<sup>-1</sup>). By contrast, a significant difference was observed for the soil C stocks ( $113.2 \pm 4.8$  vs  $80.9 \pm 1.7$  Mg C ha<sup>-1</sup>) mainly due to the upper (0-50 cm) layer.

A small but strongly significant difference was observed for the annual soil respiration ( $22.1 \pm 0.4$  vs  $20.0 \pm 0.3$  Mg C ha<sup>-1</sup> yr<sup>-1</sup>) resulting in different TBCA ( $17.4 \pm 0.5$  vs  $15.3 \pm 0.3$  Mg C ha<sup>-1</sup> yr<sup>-1</sup>). For both forests, TBCA was more three times higher than the aboveground litterfall.