

Would wood make the difference? Species-specific mangrove wood carbon in Gazi Bay, Kenya

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In the light of the drastic change in the greenhouse condition of our planet, the importance of the open oceans and coastal ecosystems as carbon sink (blue carbon) gains more consideration, as the magnitude of these sinks is larger than that of terrestrial ecosystems. Mangroves have been reported to store between $990 \pm 96 \text{ Mg C ha}^{-1}$ and $1,074 \pm 171 \text{ Mg C ha}^{-1}$ carbon (C), significantly more than what is found in boreal, temperate and tropical upland forests. Mangroves as an intertidal forest ecosystem which develops worldwide along tropical coasts, are relatively species-poor, with less than 80 species worldwide. Yet they cover a range of growth forms and wood types, belonging to 17 phylogenetically diverse families. Expectedly they exhibit a different C sequestration potential. There is a need to better understand the C sequestration of different mangroves under various ecological settings and drivers. We set out to study C content in mangrove wood of 10 species occurring in the Western Indian Ocean region, with a focus on the well-studied mangrove forest of Gazi Bay, Kenya, where ecological conditions and vegetation structure have been well described over the last 3 decades. This project is framed by the Trans-Coast project (Kenya, Tanzania, Flanders-Belgium) which aims at giving scientific support to the Kenyan-Tanzanian initiative for a (coastal) transboundary conservation area. We report on the patterns of (above ground) C density in wood of different mangrove species, the within-species variation in the land-sea intertidal ecotone and in relation to the natural or planted origin of the mangrove stand using methods including micro CT-scanning, loss-on-ignition and elemental analysis. These data can be a basis of both better mangrove C accounting, important to C offsetting schemes and community-based C credit initiatives which develop in the region and may give insights in C sequestration optimisation strategies.