

Stand structure and carbon stocks in a *Pelliciera rhizophorae* dominated mangrove forest in Montijo Gulf Ramsar site, Panama

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Abstract

Better assessment of different mangrove forests is needed to quantify global mangrove carbon stocks. Furthermore, the Ramsar Convention on Wetlands has made it one of its priorities to encourage the participating parties to work on the assessment of mangrove carbon sequestration and storage capacity. Forest structure and carbon stocks were examined in a *Pelliciera rhizophorae* dominated mangrove forest in Montijo Gulf Ramsar site, Pacific Coast, Panama. Three 20 by 20 m plots were set up along three 200 m long transects extending from the river to the hinterland. A forest inventory was conducted including the measurement of tree height and diameter of stems (D130) for all trees with a diameter greater than 10 cm. In 5 by 5 m subplots all trees with a diameter between 2.5 and 10 cm were recorded and measured. Above- and belowground carbon stocks were estimated using existing allometric equations. Despite comparatively low species diversity (*P. rhizophorae*, *Rhizophora racemosa*, *Avicennia germinans* and *Mora oleifera*) there was a considerable variation in forest structure. *Pelliciera rhizophorae* dominated the plots located closer to the river with tree densities (> 10 cm diameter) between 350 and 1200 trees ha⁻¹. Further inland, species composition shifted towards a *R. racemosa* dominated forest. Across all plots *P. rhizophorae* was smaller in diameter and height than *R. racemosa*. Aboveground carbon stocks varied fourfold among plots, from 40 Mg C ha⁻¹ to 160 Mg C ha⁻¹ (average: 88 Mg C ha⁻¹). Average belowground carbon stock was 33 Mg C ha⁻¹. Lower carbon stocks of *P. rhizophorae* are explained by lower diameter and height but also by a lower wood density compared to the other species. The amount of carbon stored in this *P. rhizophorae* dominated mangrove forest, located within the Montijo Gulf Ramsar site, is within the range reported for other mangrove forests in Central America and the Caribbean.

Keywords

carbon storage, biomass estimation, mangrove forest structure, diameter-height-curves, allometry