

**MANGROVE COMMUNITY STRUCTURE, ABOVEGROUND BIOMASS,
AND CARBON STOCK ASSESSMENT IN THE COASTAL AREA OF
SANTA CRUZ, DAVAO DEL SUR, PHILIPPINES**

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ABSTRACT

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Mangrove ecosystems play a crucial role in carbon sequestration and climate change mitigation. However, these functions remain understudied in Sta. Cruz, Davao del Sur. Thus, this study assessed the mangrove community structure, aboveground biomass, and carbon stock in the area. Thirty-six 10 × 10 m transect plots were established for tree inventory and measurement. The mangrove forest consists of five species from three families, exhibiting low species diversity ($H'=0.83$) and significant species dominance ($D=0.53$), yet high evenness ($J'=0.70$). Among sites, Tuban had the highest diversity ($H'=1.04$), and evenness ($J=0.94$), with no dominant species ($D=0.37$). *Avicennia marina* was the most abundant species ($RA=67.80\%$) and had the highest importance value ($IVI=114.77\%$). Despite its limited population, *Sonneratia alba* contributed the most to aboveground biomass ($\bar{x}=110.11 \text{ Mg ha}^{-1}$) and carbon stock ($\bar{x}=52.85 \text{ MgC}$

ha⁻¹). A weak negative correlation ($r_s = -0.1$) was observed between species importance, aboveground biomass, and carbon stock. The mangrove forest's average aboveground biomass (43.87 Mg ha⁻¹) aligned with IPCC default values, while its carbon stock (21.06 MgC ha⁻¹) was comparatively lower. These baseline data suggest that while the area retains considerable biomass, but less carbon stock and low biodiversity, underscoring the need for targeted conservation efforts to enhance the ecosystem's stability and ecological function.

Keywords: *Sonneratia alba*; carbon sequestration; allometric equations; negative correlation; targeted intervention

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