

ABSTRACT

This research aims to analyze litter production in mangrove ecosystems and the carbon content stored within this litter in Lhokseumawe City. The study was conducted from April to June 2025 across five observation stations, each with distinct characteristics: Blang Crum, Cut Mamplam, Panggoi, Ujong Blang, and Rancong villages. The methodology for litter collection involved deploying litter traps measuring $1 \times 1 \text{ m}^2$, installed at a height of 1.5–2 m above the ground. Litter samples were collected every 14 days over a two-month period. Subsequently, these samples were dried in an oven at 105°C for 24 hours to obtain their dry weight. The results demonstrated that the highest litter production rate was found at Station 3 ($6.16 \text{ g/m}^2/\text{day}$), while the lowest was recorded at Station 2 ($1.98 \text{ g/m}^2/\text{day}$). Correspondingly, the highest carbon content was also identified at Station 3 ($10.11 \text{ tons/ha/year}$), with the lowest at Station 2 ($3.26 \text{ tons/ha/year}$). Key water quality parameters, including temperature, salinity, and pH, were also measured and exhibited variations between stations; however, all values remained within established quality standards. These findings indicate that vegetation density, mangrove species composition, and local environmental conditions play a crucial role in determining litter productivity and carbon storage capacity. The study concludes that the mangrove ecosystems in Lhokseumawe hold significant potential as substantial carbon sinks and providers of organic matter. It is recommended that future research focus on the decomposition processes of this litter, its relationship with macrozoobenthos communities, and the subsequent dynamics of organic matter, particularly in the waters of Lhokseumawe city.

Keywords: Density, Lhokseumawe, mangroves, vegetation, water content