

ABSTRACT

Najwa Fadila Annisa. 24020122130104. **Morphological and Anatomical Analysis of White Mangrove Leaves [*Avicennia marina* (Forsk.) Vierh] Based on Zoning at Pasarbanggi Beach, Rembang.** Department of Biology, Faculty of Science and Mathematics, Diponegoro University, Semarang, under the supervision of Prof. Dr. Dra. Erma Prihastanti, M. Si. and Prof. Dr. Dra. Endah Dwi Hastuti, M. Si.

Mangrove ecosystems play an important ecological role in coastal areas, but varying environmental conditions between zones can affect the structure and adaptation of mangrove plants, particularly *Avicennia marina*. This study aims to analyze the environmental conditions and morphological and anatomical structure of *A. marina* leaves in various zones in the Pasarbanggi Mangrove Forest Conservation Area, Rembang. The study was conducted in April–May 2025 using a completely randomized design with one factor, namely location, consisting of Zone I (≤ 200 m), Zona II (≤ 400 m), and Zona III (≤ 600 m) from the coastline with three replicates. The environmental parameters observed included water temperature, air temperature, salinity, pH, Dissolved Oxygen (DO), and sediment organic C, total N, and phosphate content. Morphological and anatomical leaf parameters included leaf area, length, and width, as well as leaf thickness, upper epidermis, hypodermis, and mesophyll. Data were analyzed using ANOVA, DMRT test, and Pearson correlation. The results of the study show that there are significant differences in environmental conditions between stations, with Zone I characterized by the highest temperature, salinity, pH and DO, and Zone III showing higher sediment nutrient accumulation. These differences in conditions affect the variation in the leaf structure of *A. marina*, with Zone II having the largest leaf size, while Station I shows smaller leaf size with higher anatomical tissue thickness. This indicates that *A. marina* is able to adapt to differences in zoning through morphological and anatomical leaf adjustments. Salinity is the environmental parameter that most influences leaf thickness.

Keywords: *Coastal zoning; environmental parameters; leaf morphology and anatomy*