

## ABSTRACT

Desi Melianawati. **Ultrastructural Analysis, Viability, and Germination Percentage of Mangrove *Rhizophora mucronata* Lamk. Polen at Different Zoning and Seasons in the Dasun River, Rembang Regency.** Supervised by Prof. Dr. Dra. Erma Prihastanti, M.Si. and Prof. Dr. Endah Dwi Hastuti, M.Si.

The mangrove *Rhizophora mucronata* plays a vital ecological role in maintaining the balance of coastal ecosystems. However, environmental changes and anthropogenic activities have the potential to affect the reproductive processes of this plant, particularly pollen viability and germination. This study aims to analyze the ultrastructure, viability, and percentage of pollen germination of *R. mucronata* in different zones and seasons in the Dasun River, Rembang Regency. The research method includes flower sampling from three zones with varying environmental characteristics during the rainy and dry seasons. Analysis was carried out on flower morphology, pollen ultrastructure using an electron microscope, as well as viability tests with acetocarmine and pollen germination using Brewbaker & Kwack media. The research design model used was a factorial Completely Randomized Design (CRD). The first factor is the growing environment which consists of three zones, namely zone I (Z1) is 120.08 m from the Dasun coast, zone II (Z2) is 111.35 m from Z1, and zone III (Z3) is 161.46 m from Z2. The second factor is the difference in seasons, namely samples were taken in the dry season (M1) and the rainy season (M2). The data obtained were analyzed using ANOVA tests to evaluate the influence of environmental factors and seasons on the observed variables. The results showed that zoning affects salinity, and environmental ORP, pollen P/E index after germination, germination percentage and pollen tube length of *R. mucronata*. Season affects salinity, environmental Oxidation-Reduction Potential (ORP), and precipitation, pollen P/E index after germination, and pollen tube length of *R. mucronata*. The interaction between zoning and season affects environmental salinity and ORP, pollen P/E index before and after germination and pollen viability of *R. mucronata*. The highest P/E index was found in zone I during the dry season, while the highest P/E index after germination was found in zone I during the rainy season. The highest pollen viability was recorded in zone II during the rainy season, and the highest pollen germination percentage was found in zone II and the dry season. The highest average pollen tube length was found in zone II and the rainy season. Zone II during the rainy season was identified as the most optimal environmental condition to support the growth and development of flowers and pollen.

**Keywords:** *Rhizophora mucronata*, pollen ultrastructure, pollen viability, germination, mangrove ecosystem.