ABSTRAK

REDUKSI GELOMBANG DENGAN MANGROVE *Rhizophora sp* SEBAGAI ALTERNATIF PELINDUNG PANTAI (STUDI KASUS PANTAI TANJUNG PUTUS, PESAWARAN)

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Gelombang laut menyebabkan abrasi garis pantai di Pantai Tanjung Putus, Indonesia. Salah satu solusi untuk mengatasinya adalah menggunakan mangrove sebagai peredam gelombang. Tujuan penelitian adalah menganalisis peredaman gelombang oleh mangrove *Rhizophora sp* dengan variabel ketebalan hutan dan kelentingan akar tunjang. Penelitian menggunakan metode transek kuadrat dan uji laboratorium menggunakan alat *Tensile Testing Machine*. Dengan 30 meter ketebalan mangrove yang diamati terjadi perubahan nilai peredaman energi (ΔE), persentase peredaman energi (ΔE%), dan nilai kelentingan akar. Nilai ΔE menurun signifikan seiring dengan bertambahnya ketebalan hutan mangrove, menunjukkan hubungan berbanding terbalik antara kedua variabel tersebut. Nilai ΔE% meningkat signifikan seiring dengan bertambahnya ketebalan hutan mangrove, menandakan hubungan berbanding lurus antara kedua variabel. Nilai kelentingan menurun seiring dengan bertambahnya ketebalan hutan mangrove, menandakan hubungan berbanding terbalik antara kedua variabel tersebut. Kesimpulannya adalah pohon mangrove dan akar tunjangnya berperan sebagai peredam gelombang alami untuk melindungi pemukiman pesisir pantai. Hal ini ditunjukkan dengan grafik peredaman hutan mangrove *Rhizophora sp* di lokasi penelitian.

Kata Kunci : Abrasi, Kelentingan, Peredaman Energi, *Tensile Testing Machine*.

ABSTRACT

WAVE ATTENUATION BY *Rhizophora sp*. MANGROVE AS A COASTAL PROTECTION ALTERNATIVE (CASE STUDY OF TANJUNG PUTUS BEACH, PESAWARAN)

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Shoreline abrasion from wave action is a major concern at Tanjung Putus Beach, Indonesia. Mangrove forests, with their dense vegetation and intricate root systems, offer a natural solution to mitigate wave-induced erosion. This study investigates the wave attenuation capacity of Rhizophora sp. mangroves, considering forest thickness and root resilience. Employing the quadrat transect method, data on mangrove density was collected. Tensile Testing Machine was utilized for laboratory testing to determine supporting root resilience. The study observed a 30-meter variation in mangrove forest thickness, resulting in significant changes in wave energy attenuation (ΔE), wave energy attenuation percentage (ΔE%), and supporting root resilience values. ΔE values exhibited a significant inverse relationship with increasing mangrove forest thickness, indicating a negative correlation between the two variables. ΔE% values demonstrated a significant positive relationship with increasing mangrove forest thickness, highlighting a positive correlation between these two variables. Supporting root resilience values decreased with increasing mangrove forest thickness, indicating a negative correlation between these two variables. The findings substantiate the crucial role of mangrove trees and their supporting roots as natural wave attenuators in safeguarding coastal settlements. This is further supported by the wave attenuation graphs generated by the *Rhizophora sp*. mangrove forests at the study site.

Keywords : Abbrasion, Resilience, Wave Attenuation, Tensile Testing Machine.