

ABSTRAK

Ekosistem mangrove memiliki peran penting dalam menyerap logam berat, salah satunya Pb yang berasal dari aktivitas antropogenik di Pekalongan. Penelitian ini bertujuan untuk menganalisis karakteristik sedimen, profil vertikal logam Pb, serta hubungan Pb dengan variabel fisika-kimia sedimen di ekosistem Mangrove Kandang Panjang Kota Pekalongan. Penelitian dilakukan pada dua stasiun dengan pembagian kedalaman sedimen 0–20, 20–40, 40–60, 60–80, dan 80–100 cm, menggunakan metode purposive sampling. Variabel yang diamati meliputi fraksi sedimen, bahan organik, pH tanah, dan logam Pb. Hasil penelitian menunjukkan bahwa sedimen didominasi fraksi halus dengan kategori lempung berdebu. Kandungan bahan organik berkisar 0,32–2,50% dengan rata-rata tergolong rendah (1,0–2,0%), sedangkan nilai pH tanah berkisar antara 6,1–7,5. Kandungan Pb tertinggi (28,56 mg/kg) ditemukan pada stasiun 2 di kedalaman 20–40 cm, dan terendah (6,58 mg/kg) pada stasiun 1 di kedalaman 80–100 cm. Analisis Pearson menunjukkan korelasi positif antara Pb dengan bahan organik dan fraksi debu, serta korelasi negatif dengan pH dan kedalaman. Faktor kontaminasi (CF) menunjukkan bahwa sedimen mangrove di Kandang Panjang telah terkontaminasi Pb dengan kategori rendah dan indeks goeakumulasi (Igeo) mengindikasikan kondisi sedimen yang tidak tercemar. Hal ini menunjukkan bahwa sedimen mangrove mampu mengakumulasi Pb, namun belum menunjukkan indikasi pencemaran yang signifikan.

Kata kunci: bahan organik, kontaminasi, geoakumulasi, mangrove, sedimen, timbal (Pb).

ABSTRACT

Mangrove ecosystems play an important role in absorbing heavy metals, including lead (Pb) derived from anthropogenic activities in Pekalongan. This study aims to analyze sediment characteristics, vertical profiles of Pb, and its relationship with sediment physicochemical variables in the Mangrove Ecosystem of Kandang Panjang, Pekalongan City. Sampling was carried out at two stations with depths of 0–20, 20–40, 40–60, 60–80, and 80–100 cm using purposive sampling. Observed variables included sediment fractions, organic matter, soil pH, and Pb concentration. The results showed that the sediment was dominated by fine fractions, categorized as silty clay. Organic matter content ranged from 0.32–2.50%, with an average classified as low (1.0–2.0%), while pH values ranged from 6.1 to 7.5. The highest Pb concentration (28.56 mg/kg) was found at station 2 at a depth of 20–40 cm, and the lowest (6.58 mg/kg) at station 1 at a depth of 80–100 cm. Pearson's correlation showed a positive relationship between Pb and both organic matter and silt fractions, and a negative correlation with pH and depth. The contamination factor (CF) indicated that the sediment was slightly contaminated, while the geoaccumulation index (I_{geo}) indicated an uncontaminated condition. This suggests that mangrove sediments have the ability to accumulate Pb, but have not yet shown significant pollution.

Keywords: organic matter, contamination, geoaccumulation, mangrove, sediment, lead (Pb)

