

ABSTRAK

Mikroplastik merupakan salah satu bentuk pencemaran yang signifikan di lingkungan pesisir dan estuari, termasuk ekosistem mangrove yang memiliki kemampuan menjebak partikel-partikel kecil seperti mikroplastik. Penelitian ini bertujuan untuk menganalisis karakteristik, jenis polimer, dan kelimpahan mikroplastik pada variasi kedalaman sedimen di Ekosistem Mangrove Kandang Panjang, Pekalongan. Pengambilan sampel dilakukan pada 9 plot dimana setiap plot memiliki 3 kedalaman sedimen (0–20 cm, 20–40 cm, dan 40–60 cm). Penentuan plot dilakukan menggunakan metode *random sampling*. Analisis mikroplastik dilakukan secara visual menggunakan mikroskop stereo serta identifikasi polimer menggunakan *Fourier Transform Infrared Spectroscopy* (FTIR). Hasil penelitian menunjukkan bahwa bentuk mikroplastik yang dominan adalah fragmen (57%) dan fiber (42%), dengan warna dominan hitam dan hijau. Jenis polimer yang teridentifikasi mencakup *Poly (Vinyl Stearate)*, *Polyethylene*, dan variannya. Kelimpahan tertinggi ditemukan pada kedalaman 0–20 cm sebesar 613 partikel/kg berat sedimen kering dan menurun seiring bertambahnya kedalaman. Hal ini diduga akibat waktu dekomposisi partikel yang relatif baru di lokasi tersebut, sehingga distribusi secara vertikal belum terjadi secara signifikan. Penelitian ini menegaskan bahwa Kawasan Ekosistem Kandang Panjang, Pekalongan sudah tercemar mikroplastik hingga kedalaman sedimen 60 cm. Hal ini menunjukkan perlunya upaya pengelolaan limbah yang lebih efektif.

Kata kunci: FTIR, mangrove, mikroplastik, sedimen

ABSTRACT

Microplastics are a significant form of pollution in coastal and estuary environments, including mangrove ecosystems that have the ability to trap small particles such as microplastics. This study aims to analyze the characteristics, polymer types, and abundance of microplastics at varying sediment depths in the Kandang Panjang Mangrove Ecosystem, Pekalongan. Sampling was conducted in 9 plots where each plot had three sediment depths (0-20 cm, 20-40 cm, and 40-60 cm). Plot determination was done using random sampling method. Microplastic analysis was conducted visually using a stereo microscope and polymer identification using Fourier Transform Infrared Spectroscopy (FTIR). The results showed that the dominant forms of microplastics were fragments (57%) and fibers (42%), with dominant colors of black and green. Polymer types identified include Poly (Vinyl Stearate), Polyethylene, and its variants. The highest abundance was found at 0-20 cm depth of 613 particles/kg dry sediment weight and decreased with increasing depth due to the decomposition time of particles that tend to be new in that location, vertical distribution has not yet occurred significantly. Spearman correlation test results showed a negative relationship $r = -0.493$, $p < 0.01$) where the higher the depth level, the abundance of microplastics obtained will decrease. This study confirms that the Kandang Panjang Ecosystem Area, Pekalongan is contaminated with microplastics up to 60 cm sediment depth and suggests the need for management efforts.

Keywords: FTIR, mangrove, microplastics, sediment