

RINGKASAN

Mikroplastik adalah partikel plastik berukuran pada rentang 1-5 mm yang berasal dari degradasi plastik dan telah menjadi salah satu polutan lingkungan. Dan merupakan ancaman bagi biota laut. Mangrove yang memiliki fungsi sebagai area penampung sedimen dan polutan, termasuk mikroplastik dapat mengancam fungsi ekosistem dan spesies yang bergantung padanya. Mikroplastik yang terakumulasi dalam tiram tidak hanya mempengaruhi kesehatan tiram itu sendiri tetapi juga dapat berdampak pada kesehatan manusia yang mengonsumsi tiram tersebut melalui konsumsi langsung. Tujuan penelitian adalah membandingkan karakteristik fisik (tipe, warna, ukuran), karakteristik kimia (jenis polimer) dan kelimpahan (jumlah partikel) mikroplastik pada tiram bakau, sedimen dan perairan dan mendeskripsikan morfometri serta menganalisa hubungan antara bobot tiram bakau dengan kelimpahan mikroplastik yang terdapat di perairan mangrove Kulon Progo, Daerah Istimewa Yogyakarta.

Lokasi penelitian adalah perairan mangrove Kulon Progo, Daerah Istimewa Yogyakarta. Pengambilan sampel tiram bakau, sedimen dan air menggunakan teknik *purposive sampling* berdasarkan perbedaan pasang surut air laut sebanyak empat stasiun. Kelimpahan mikroplastik dihitung dalam satuan partikel/g berat sampel. Karakteristik mikroplastik diamati menggunakan uji mikroskop serta uji *Fourier Transform Infra Red* (FTIR). Data karakteristik fisik (tipe, warna, dan ukuran), karakteristik kimia (jenis polimer), dengan analisis deskriptif komparatif. Untuk membandingkan kelimpahan mikroplastik pada semua objek penelitian dianalisis dengan uji signifikansi Kruskal-Wallis, untuk membandingkan lebih dari dua kelompok kelimpahan tiram bakau, sedimen, dan air dengan jumlah sampel uji 34. Uji Mann-Whitney untuk membandingkan yang terdapat pada tiram bakau dan sedimen, tiram bakau dan air, serta sedimen dan air. Hubungan bobot tiram bakau dengan kelimpahan dianalisis dengan korelasi linier.

Hasil menunjukkan tipe mikroplastik banyak ditemukan pada tiram bakau dan air adalah fragmen (42,53% dan 45,92%), dan pada sedimen adalah fiber (44,33%). Warna coklat banyak ditemukan pada tiram bakau dan sedimen (46,8% dan 41,2%), dan pada air adalah warna biru (37,8%). Ukuran mikroplastik yang paling banyak ditemukan adalah 0,1-0,5 mm. Jenis polimer paling banyak ditemukan adalah PE dan PP. Kelimpahan rata-rata yang ditemukan pada tiram bakau (65,83 partikel/g), sedimen (0,24 partikel/g), dan air (0,98 partikel/L). Kelimpahan mikroplastik paling banyak ditemukan pada tiram bakau dengan perbedaan antara tiram bakau, sedimen, dan air. Tiram bakau di perairan mangrove Kulon Progo memiliki rata-rata panjang 46,13 mm, lebar 30,68 mm, tebal cangkang 13,09 mm, dan bobot 9,17 g. Kelimpahan mikroplastik meningkat seiring dengan bertambahnya bobot tiram bakau.

Kata kunci: *karakteristik, kelimpahan, mikroplastik, mangrove, tiram bakau.*

SUMMARY

Microplastics are plastic particles ranging in size from 1-5 mm, originating from the degradation of larger plastic debris, and have become one of the major environmental pollutants. They pose a threat to marine organisms. Mangrove ecosystems, which function as natural traps for sediments and pollutants including microplastics are at risk of ecological disruption, potentially affecting the species that depend on them. Microplastics accumulated in oysters not only impact the health of the oysters themselves but may also pose risks to human health through direct consumption. The aim of this study is to compare the physical characteristics (type, color, size), chemical characteristics (polymer type), and abundance (number of particles) of microplastics in mangrove oysters, sediment, and water, as well as to describe the morphometry and analyze the relationship between the weight of mangrove oysters and the abundance of microplastics in the mangrove waters of Kulon Progo, Special Region of Yogyakarta.

The study site is located in the mangrove waters of Kulon Progo, Special Region of Yogyakarta. Sampling of mangrove oysters, sediment, and water was conducted using purposive sampling based on tidal differences across four stations. The abundance of microplastics was measured in units of particles per gram of sample weight. Microplastic characteristics were observed using microscopic analysis and Fourier Transform Infrared Spectroscopy (FTIR). The physical characteristics (type, color, and size) and chemical characteristics (polymer type) of microplastics were analyzed using descriptive comparative analysis. To compare the abundance of microplastics across all research objects, the Kruskal-Wallis significance test was used to assess differences among more than two groups—mangrove oysters, sediment, and water—with a total of 34 test samples. The Mann-Whitney test was used for pairwise comparisons between mangrove oysters and sediment, mangrove oysters and water, as well as sediment and water. The relationship between the weight of mangrove oysters and microplastic abundance was analyzed using linear correlation.

The results showed that the most abundant type of microplastic in mangrove oysters and water was fragments (42,53% and 45,92%), while in sediment, fibers were the most abundant (44,33%). Brown was the most abundant color in mangrove oysters and sediment (46,8% and 41,2%), whereas blue was the most abundant color in water samples (37.8%). The most abundant microplastic size was 0,1–0,5 mm. The polymer types most abundant identified were PE and PP. The average abundance of microplastics was found to be 65,83 particles/g in mangrove oysters, 0,24 particles/g in sediment, and 0,98 particles/L in water. Mangrove oysters exhibited a higher abundance of microplastics relative to sediment and water samples. Mangrove oysters in the Kulon Progo mangrove waters had an average shell length of 46,13 mm, width of 30,68 mm, thickness of 13,09 mm, and weight of 9,17 g. The abundance of microplastics increased with the weight of the mangrove oysters.

Keywords: *characteristics, abundance, microplastics, mangrove, mangrove oyster.*