

ABSTRAK

Pencemaran mikroplastik di ekosistem mangrove Indonesia, yang berfungsi sebagai penyangga biodiversitas pesisir, telah menjadi ancaman kritis bagi biota laut khususnya organisme *filter feeder* seperti kerang totok (*Geloina expansa*). Konsumsi kerang terkontaminasi berpotensi memicu risiko kesehatan manusia melalui transfer toksin dan patogen. Penelitian ini menganalisis secara komprehensif kelimpahan, karakteristik fisik (bentuk, ukuran, warna), komposisi polimer, serta sumber kontaminasi mikroplastik pada jaringan *Geloina expansa* di ekosistem mangrove Desa Tritih Kulon, Cilacap. Sebanyak 34 sampel kerang dari tiga stasiun diproses melalui *digesti alkali* (KOH 10%, 24 jam pada suhu 60°C), dilanjutkan proses filtrasi menggunakan Whatman 0,45 µm, identifikasi visual dengan mikroskop stereo 40× (berdasarkan protokol NOAA), dan karakterisasi polimer menggunakan FTIR-ATR. Hasil menunjukkan kelimpahan mikroplastik pada *Geloina expansa* sebesar 0,41 partikel/g, di dominasi *fiber* (72%) dan *film* (28%) berukuran 487,69–10.376,96 µm dengan variasi warna: hitam (72%), biru (8%), hijau (6%), dan transparan (14%). Analisis FTIR mengidentifikasi empat polimer utama: *polyphenylene oxide* (PPO), campuran PPO/PA (NORYL), *poly ethyl methacrylate* (PEMA), dan *polyvinyl butyral* (PVB) jenis material yang ditemukan bersumber dari industri otomotif, kemasan, dan pelapis. Konsentrasi tertinggi terdeteksi di Stasiun 3 (muara sungai), menunjukkan kontribusi signifikan dari aktivitas antropogenik daratan.

Kata Kunci: FTIR, Mikroplastik, *Geloina expansa*, Polimer industri, Tritih Kulon.

ABSTARCT

*Microplastic pollution in Indonesia's mangrove ecosystems, which serve as critical buffers for coastal biodiversity, poses a severe threat to marine biota particularly filter-feeding organisms like the blood clam (*Geloina expansa*). Consuming contaminated clams may transfer toxins and pathogens, elevating human health risks. This study comprehensively analyzed the abundance, physical characteristics (shape, size, color), polymer composition, and contamination sources of microplastics in *Geloina expansa* tissues within the mangrove ecosystem of Tritih Kulon Village, Cilacap. 34 bivalve samples from 3 stations were processed via alkaline digestion (10% KOH, 24h at 60°C), filtration (0.45 µm Whatman membrane), visual identification under 40× stereo microscopy (following NOAA protocols), and polymer characterization using FTIR-ATR. Results revealed a mean abundance of 0.41 particles/gram tissue, dominated by fibers (72%) and films (28%) sized 487.69–10,376.96 µm in black (38%), blue (29%), green (19%), and transparent (14%). FTIR analysis identified four primary polymers: polyphenylene oxide (PPO), PPO/PA blend (NORYL), poly ethyl methacrylate (PEMA), and polyvinyl butyral (PVB) materials commonly used in automotive, packaging, and coating industries. The highest contamination occurred at station 3 (near the river estuary), indicating significant microplastic pollution from anthropogenic riverine activities.*

Keywords: FTIR, *Geloina expansa*, Microplastics, Tritih Kulon, Industrial polymers.

