

ABSTRAK

Kontaminasi mikroplastik di ekosistem laut mengancam keamanan pangan dan kesehatan manusia. Penelitian ini menganalisis karakteristik, kelimpahan, dan komposisi polimer mikroplastik pada ikan layang (*Decapterus russelli*) di perairan Rembang serta mengevaluasi risiko toksikologis melalui *Polymer Hazard Index* (PHI). Sampel ikan dikoleksi dari tiga lokasi di Desa Banggi, Kragan, dan Dasun dengan lima individu per lokasi. Mikroplastik diisolasi dari daging dan saluran pencernaan menggunakan digesti H₂O₂ 30%, dikarakterisasi berdasarkan bentuk dan warna, serta diidentifikasi komposisi polimernya menggunakan spektroskopi FTIR. Hasil menunjukkan mikroplastik terdeteksi pada 100% sampel dengan predominansi fiber di daging dan film di saluran pencernaan. Warna hitam mendominasi di daging (64,91%) dan transparan di saluran pencernaan (48,30%). Kelimpahan di daging berbeda signifikan antar lokasi (uji *Kruskal-Wallis*: H=9,448; p=0,009) dengan Banggi tertinggi (3,20±1,09 partikel/gram), diikuti Dasun (1,43±0,53 partikel/gram) dan Kragan (1,26±0,74 partikel/gram). Kelimpahan di saluran pencernaan tidak berbeda signifikan (H=0,562; p=0,755) dengan rentang 37,51-47,85 partikel/gram. FTIR mengidentifikasi polietilena (PE), poliamida/nylon (PA), polistirena (PS), polikarbonat (PC), polivinil klorida (PVC), dan poliasetat (POM). Nilai PHI tertinggi pada daging Banggi (197,21; Kategori Sangat Tinggi) akibat predominansi PC dan POM. Rata-rata PHI daging (81.34) lebih tinggi dari saluran pencernaan (19.84), mengindikasikan translokasi selektif polimer berbahaya. Keberadaan PVC (*hazard score* 10.000) dan PC (*hazard score* 1.000) menimbulkan kekhawatiran toksikologis serius. Diperlukan strategi mitigasi komprehensif meliputi penguatan regulasi, monitoring rutin, dan edukasi untuk melindungi keamanan pangan seafood.

Kata kunci: mikroplastik, *Decapterus russelli*, FTIR, *Polymer Hazard Index*, perairan Rembang

ABSTRACT

Microplastic contamination in marine ecosystems threatens food security and human health. This study analyzed characteristics, abundance, and polymer composition of microplastics in round scad (*Decapterus russelli*) from Rembang waters and evaluated toxicological risks through Polymer Hazard Index (PHI). Fish samples were collected from three locations at village Banggi, Kragan, and Dasun with five individuals per location. Microplastics were isolated from muscle and gastrointestinal tract using 30% H₂O₂ digestion, characterized by shape and color, and identified for polymer composition using FTIR spectroscopy. Results showed microplastics detected in 100% samples with fiber predominance in muscle and films in gastrointestinal tract. Black color dominated in muscle (64.91%) and transparent in gastrointestinal tract (48.30%). Abundance in muscle differed significantly among locations (Kruskal-Wallis test: H=9.448; p=0.009) with Banggi highest (3.20±1.09 particles/gram), followed by Dasun (1.43±0.53 particles/gram) and Kragan (1.26±0.74 particles/gram). Abundance in gastrointestinal tract showed no significant difference (H=0.562; p=0.755) ranging from 37.51-47.85 particles/gram. FTIR identified polyethylene (PE), polyamide/nylon (PA), polystyrene (PS), polycarbonate (PC), polyvinyl chloride (PVC), and polyacetal (POM). Highest PHI value in Banggi muscle (197.21; Very High Category) due to PC and POM predominance. Average PHI of muscle (81.34) was higher than gastrointestinal tract (19.84), indicating selective translocation of hazardous polymers. Presence of PVC (*hazard score* 10,000) and PC (*hazard score* 1,000) raises serious toxicological concerns. Comprehensive mitigation strategies including regulation strengthening, routine monitoring, and education are required to protect seafood safety.

Keywords: microplastics, *Decapterus russelli*, FTIR, Polymer Hazard Index, Rembang waters

