Akumulasi Mikroplastik, Tembaga (Cu), Dan Konsentrasi Metallothionein Pada Zooplankton Dan Ikan Bandeng *Chanos Chanos* (Fabricius, 1775) Di Keramba Jaring Tancap, Semarang

ABSTRAK

Berbagai aktivitas di pesisir Tanjung Mas, Semarang, seperti kegiatan pelabuhan, industri, dan aktivitas manusia, diduga menjadi sumber utama pencemaran perairan yang signifikan. Penelitian ini bertujuan mengevaluasi tingkat pencemaran mikroplastik, logam berat tembaga (Cu), serta konsentrasi metallothionein (MT) sebagai indikator respons biologis terhadap stres logam. Sampel diambil dari empat stasiun yang dipilih berdasarkan variasi aktivitas antropogenik dan umur ikan bandeng sebagai organisme bioindikator. Hasil menunjukkan bahwa mikroplastik terdeteksi di seluruh kompartemen, dengan kelimpahan tertinggi pada sampel air di stasiun T1, dominasi zooplankton subfilum Crustacea, serta akumulasi mikroplastik terbanyak pada saluran pencernaan ikan bandeng. Karakteristik mikroplastik didominasi oleh bentuk fiber, warna hitam, dan ukuran kecil. Kandungan Cu melebihi ambang batas baku mutu pada sampel air, zooplankton, dan organ ikan (otot, insang, saluran pencernaan). Peningkatan konsentrasi MT seiring akumulasi Cu mengindikasikan respons fisiologis ikan terhadap paparan logam berat. Temuan ini menegaskan peran ikan bandeng sebagai bioindikator pencemaran di perairan pesisir dan memberikan kontribusi penting bagi kajian ekotoksikologi serta pengelolaan lingkungan perairan berkelanjutan.

Kata kunci: Mikroplastik, logam tembaga, metallothionein, *Chanos chanos*, keramba jaring tancap

Accumulation of Microplastics, Copper (Cu), and Metallothionein Concentration in Zooplankton and Milkfish *Chanos chanos* (Fabricius, 1775) in Staked Net Cages, Semarang

ABSTRACT

Various activities along the Tanjung Mas coast in Semarang, including port operations, industrial sources, and human activities, are suspected to cause significant water pollution. This study aims to evaluate the contamination of microplastics, heavy metal copper (Cu), and metallothionein (MT) concentrations. Samples were collected from four stations selected based on variations in anthropogenic activities and fish age. The results revealed that microplastics were detected across all compartments, with the highest abundance in water samples at station T1, dominance of the crustacean subphylum in zooplankton, and the greatest accumulation found in the digestive tract of milkfish (*Chanos chanos*). The microplastics were predominantly fibers, black in color, and small in size. Copper concentrations exceeded threshold limits in all samples, including water, zooplankton, and fish organs such as muscle, gills, and digestive tract. An increase in MT concentration corresponded with Cu accumulation, indicating a biological response to metal-induced stress. This study confirms that milkfish can serve as an effective bioindicator of coastal water pollution and provides valuable insights for ecotoxicological research and sustainable aquatic environmental management.

Keywords: Microplastics, copper, metallothionein, *Chanos chanos*, staked net cages