#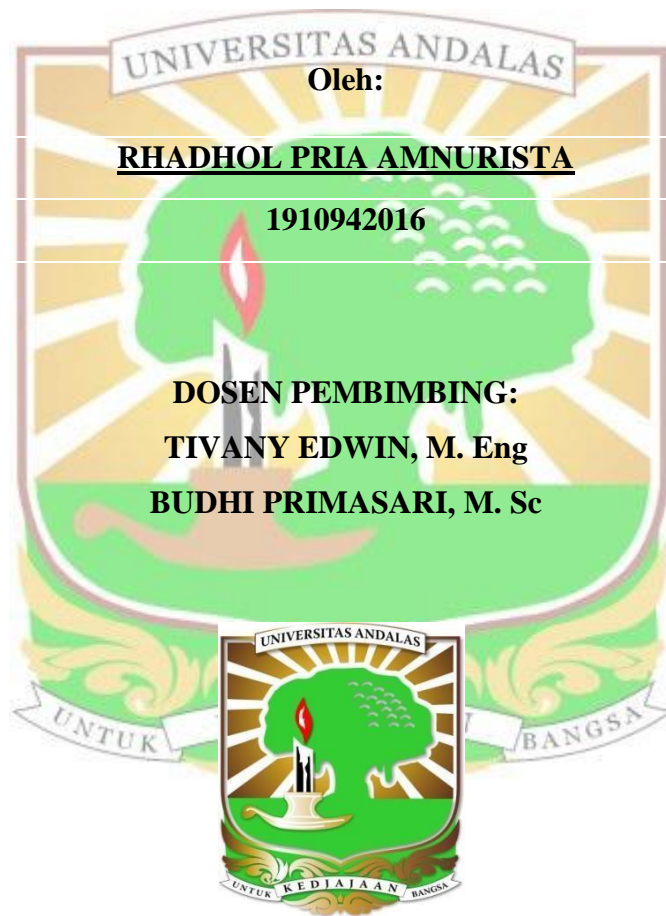 KARAKTERISASI MIKROPLASTIK PADA IKAN NILA (*Oreochromis niloticus*) HASIL BUDIDAYA DI DAERAH ALIRAN SUNGAI AIR DINGIN KOTA PADANG

TUGAS AKHIR

Sebagai salah satu syarat untuk menyelesaikan
Program Strata-1 pada
Departemen Teknik Lingkungan
Fakultas Teknik Universitas Andalas penelitian

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ABSTRAK

Sungai Air Dingin merupakan salah satu sungai yang dimanfaatkan masyarakat dalam budidaya ikan nila (*Oreochromis niloticus*) di Kota Padang. Penelitian ini bertujuan untuk menganalisis konsentrasi, biokonsentrasi, dan karakteristik mikroplastik pada air sungai, air kolam, dan ikan serta menganalisis perubahan temporal dan spasial, serta korelasi antara konsentrasi mikroplastik di air dan ikan. Sampel ikan berupa saluran pencernaan dan insang didestruksi menggunakan KOH, sampel air sungai dan air kolam menggunakan H_2O_2. Konsentrasi mikroplastik dianalisis menggunakan metode gravimetri. Karakteristik mikroplastik dianalisis menggunakan mikroskop dengan perbesaran 40 kali dan 100 kali, serta menggunakan spektroskopi *Fourier Transform Infrared* (FTIR). Konsentrasi rata-rata mikroplastik sampel air sungai, kolam, saluran pencernaan, dan insang ikan berkisar antara 20,00-36,67 partikel/L, 11,67-25,00 partikel/L, 3,89-4,67 partikel/ikan, dan 2,89-3,56 partikel/ikan. Serapan mikroplastik dari air ke organ ikan rendah (Biokonsentrasi faktor<100). Bentuk yang ditemukan pada sampel air sungai, kolam, dan ikan didominasi mikroplastik fiber berkisar 69%-87%. Warna mikroplastik pada sampel air sungai, kolam, dan ikan didominasi oleh warna hitam berkisar 23%-50%. Ukuran mikroplastik yang banyak ditemukan pada sampel air kolam berupa *Large Microplastic (LMP)* berkisar 57%-67%, dan *Small Microplastic* (SMP) pada sampel air sungai dan ikan berkisar 54%-64% dan 50%-62%. Polimer mikroplastik pada sampel air kolam, air sungai, dan ikan didominasi oleh jenis polimer *Polypropylene* (PP) berkisar 69%-86%, 58%-77%, dan 31%-62%. Konsentrasi mikroplastik sampel air sungai, kolam, dan ikan tidak terdapat perbedaan signifikan dengan waktu dan lokasi pengambilan sampel (*p-value*>0,5). Rata-rata hasil analisis korelasi menyatakan adanya hubungan berbanding lurus antara sampel ikan dan air kolam, serta sampel air sungai dan kolam.

Kata kunci: air sungai, ikan, karakterisasi, konsentrasi, mikroplastik

ABSTRACT

Air Dingin River is one of the rivers used by the community in tilapia (Oreochromis niloticus) farming in Padang City. This study aims to analyze the concentration, bioconcentration, and characteristics of microplastics in river water, pond water, and fish, as well as to analyze temporal and spatial changes in microplastic concentrations, and the correlation between microplastic concentrations in water and fish. Fish samples in the form of digestive tract and gills were deconstructed using KOH, river water and pond water samples using H_2O_2. Microplastic concentrations were analyzed using the gravimetric method. Microplastic characteristics were analyzed using a microscope with a magnification of 40 times and 100 times, and using Fourier Transform Infrared (FTIR) spectroscopy. The average concentrations of microplastics in river water, pond, digestive tract, and fish gills ranged from 20.00-36.67 particles/L, 11.67-25.00 particles/L, 3.89-4.67 particles/fish, and 2.89-3.56 particles/fish. The uptake of microplastics from water to fish organs was low (Bioconcentration factor<100). The shape found in river water samples, ponds, and fish is dominated by fibre microplastics ranging from 69%-87%. The color of microplastics in river water samples, ponds, and fish is dominated by black color ranging from 23%-50%. The size of microplastics found in pond water samples is Large Microplastic (LMP) ranging from 57%-67%, and Small Microplastic (SMP) in river water samples and fish ranging from 54%-64% and 50%-62%. Microplastic polymers in pond water, river water, and fish samples are dominated by Polypropylene (PP) polymer types ranging from 69%-86%, 58%-77%, and 31%-62%. The microplastic concentration of river water, ponds, and fish samples did not have significant differences with the time and location of sampling (p-value>0.5). The average correlation analysis revealed a directly proportional relationship between fish and pond water samples, as well as river and pond water samples.

Keywords: *characterization, concentration, fish, microplastic, river water*