

**Pencemaran Mikroplastik di Sungai Code, Daerah Istimewa Yogyakarta:
Akumulasi Pada Ikan, Interaksi Logam Berat (Pb Dan Cd), Dan Penilaian
Risiko Kesehatan**

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INTISARI

Peningkatan sampah plastik di badan air Sungai Code menimbulkan pencemaran ekosistem sungai. Limbah tersebut akan mengalami proses degradasi menjadi partikel mikroplastik yang dapat terakumulasi pada organisme di perairan. Melalui proses rantai makanan, kontaminasi mikroplastik dapat berdampak pada manusia akibat adanya konsumsi ikan yang tercemar polutan. Penelitian ini berfokus pada kontaminasi mikroplastik pada ikan di Sungai Code, Daerah Istimewa Yogyakarta serta interaksinya dengan logam berat (Pb dan Cd), serta menilai potensi risiko kesehatan. Berdasarkan tingkat aktivitas manusia yang berkorelasi dengan tingkat pencemaran sampah plastik, ikan diambil dari 3 stasiun dengan cara memancing. Mikroplastik diekstraksi dari insang, saluran pencernaan, otot, dan air. Kemudian, dilakukan karakterisasi mikroplastik berdasarkan jumlah, ukuran, bentuk, warna, dan jenis polimer. Dilakukan Fourier transform infrared spectroscopy (FTIR), scanning electron microscope energy-dispersive X-ray spectroscopy (SEM-EDS), dan flame atomic absorption spectroscopy (FAAS). Potensi risiko kesehatan dinilai berdasarkan indeks bahaya polimer (PHI), indeks beban polusi (PLI), estimasi asupan harian (EDI), target bahaya (THQ), total hasil bagi target bahaya (TTHQ), dan target Risiko kanker (TR). Hasil penelitian menunjukkan mikroplastik telah mencemari air sungai dan ikan. Tingkat pencemaran limbah terkait dengan intensitas aktivitas manusia pada area sekitar aliran air sungai. Kontaminasi didominasi oleh mikroplastik berukuran kecil, warna hijau, berbentuk fiber, dan berjenis polimer LDPE. Akumulasi mikroplastik tertinggi terdapat pada organ pencernaan ikan. Terdapat asosiasi logam berat (Pb&Cd) akibat adsorpsi oleh permukaan mikroplastik. Berdasarkan perhitungan PHI, PLI, dan PERI menunjukkan risiko kontaminasi mikroplastik pada Sungai Code tergolong sedang. Berdasarkan nilai EDI, THQ, TTHQ, dan TR, ikan di Sungai Code tergolong aman dikonsumsi.

Kata kunci : Mikroplastik, Ikan, Logam Berat, Potensi Risiko Kesehatan

**Microplastic Pollution in Code Stream, Special Region of Yogyakarta:
Accumulation in Fish, Heavy Metals (Pb and Cd) Interaction, and Health
Risk Assessment**

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ABSTRACT

The increase in plastic waste in the water body of the Code Stream raises the pollution of the river ecosystem. The waste will undergo a degradation process into microplastic particles which can accumulate in organisms in the waters. Through the process of the food chain, microplastic contamination can have an impact on humans due to the consumption of polluted fish. This research focuses on microplastic contamination in fish in the Code Stream, Special Region of Yogyakarta and its interactions with heavy metals (Pb and Cd), as well as assessing potential health risks. Based on the level of human activity that correlates with the level of plastic waste pollution, fish are taken from 3 stations by fishing. Microplastics are extracted from gills, digestive tract, muscles, and water. Then characterization of microplastics was carried out based on the amount, size, shape, color, and type of polymer. Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy energy dispersive X-ray spectroscopy (SEM-EDS), and well-known atomic absorption spectroscopy (FAAS) were performed. Potential health risks are assessed based on polymer hazard index (PHI), pollution load index (PLI), estimated daily intake (EDI), hazard target (THQ), total hazard target quotient (TTHQ), and cancer risk target (TR). The research results show that microplastics have polluted river water and fish. The level of sewage pollution is related to the intensity of human activity in the area around the stream's watershed. Contamination is dominated by microplastics that are small in size, green in color, in the form of fibers, and are of the LDPE polymer type. The highest accumulation of microplastics is found in the digestive organs of fish. There are heavy metal associations (Pb and Cd) due to adsorption on the microplastic surface. Based on PHI, PLI, and PERI calculations, the risk of microplastic contamination in the Code Stream is moderate. Based on the EDI, THQ, TTHQ, and TR values, fish in the Code Stream are classified as safe for consumption.

Keywords : Microplastic, Fish, Heavy Metals, Health Risk Assessment