

**Kontaminasi Mikroplastik di Sungai Gajahwong,
Daerah Istimewa Yogyakarta: Akumulasi di Ikan, Interaksi Logam Berat,
dan Penilaian Risiko Kesehatan**

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INTISARI

Sungai Gajahwong merupakan sungai terbesar di Daerah Istimewa Yogyakarta yang terancam oleh pencemaran mikroplastik dan logam berat. Peningkatan kepadatan penduduk disekitar sungai memperparah pencemaran sepanjang aliran sungai. Penelitian mengenai risiko kesehatan yang ditimbulkan dari pencemaran mikroplastik dan asosiasinya dengan logam berat masih jarang dilakukan di Indonesia, padahal masyarakat umum mengonsumsi ikan dari Sungai Gajahwong. Penelitian dilakukan untuk mempelajari pencemaran mikroplastik pada ikan dan air Sungai Gajahwong, interaksinya dengan logam berat, serta menilai risiko kesehatannya. Sampel air dan ikan dikoleksi dari tiga stasiun. Mikroplastik diekstrak dari insang, otot, dan saluran pencernaan serta air permukaan. Karakterisasi berdasarkan bentuk, warna, ukuran, dan jumlah. Analisis FTIR untuk mengidentifikasi jenis polimer. Analisis SEM-EDS untuk mengidentifikasi permukaan mikroplastik dan mengonfirmasi keberadaan logam berat. Analisis FAAS untuk mengevaluasi konsentrasi logam berat pada sampel air, otot ikan, dan mikroplastik yang diekstraksi dari keduanya. Penilaian PHI, PLI, dan PERI untuk menilai risiko ekologis dari pencemaran mikroplastik. Penilaian EDI untuk mengestimasi konsumsi mikroplastik dan logam berat harian. Air dan ikan Sungai Gajahwong telah terkontaminasi mikroplastik dan logam berat. Mikroplastik yang ditemukan didominasi oleh bentuk fiber, berpolimer LDPE, berukuran kecil hingga sedang dengan warna hijau, hitam, dan merah. Saluran pencernaan ikan memiliki tingkat akumulasi mikroplastik tertinggi. Air dari stasiun G2 paling tercemar mikroplastik. Cd dan Pb dapat berasosiasi dengan mikroplastik. Konsentrasinya telah melampaui baku mutu. Penilaian risiko kesehatan menunjukkan bahwa Sungai Gajahwong berada di tingkat risiko sedang, namun konsumsi ikan masih tergolong aman. Konsumsi secara berlebihan dan terus menerus dalam jangka panjang dapat menimbulkan efek merugikan. Mitigasi pencemaran harus segera dilakukan.

Kata Kunci: Mikroplastik, Logam Berat, Sungai Gajahwong, Ikan, Risiko Kesehatan

**Microplastic Contamination in Gajahwong Stream,
Special Region of Yogyakarta: Accumulation in Fish, Heavy Metals
Interaction, and Health Risk Assessment**

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ABSTRACT

The Gajahwong River is the largest river in the Special Region of Yogyakarta, which is threatened by microplastic and heavy metal pollution. Increasing population density around the river exacerbated pollution along the river's flow. Research on the health risks posed by microplastic pollution and its association with heavy metals is still rarely carried out in Indonesia, even though the general public consumes fish from the Gajahwong River. The research was conducted to study microplastic pollution in fish and Gajahwong River water, its interactions with heavy metals, and its health risks. Water and fish samples were collected from three stations. Microplastics are extracted from gills, muscles, and the digestive tract, as well as surface water. Characterization is based on shape, color, size, and number. FTIR analysis to identify the type of polymer. SEM-EDS analysis was to identify microplastic surfaces and confirm the presence of heavy metals. FAAS analysis was used to evaluate heavy metal concentrations in samples of water, fish muscle, and microplastics extracted from both. PHI, PLI, and PERI assessments to assess the ecological risk of microplastic contamination. EDI assessment to estimate daily consumption of microplastics and heavy metals. The water and fish of the Gajahwong River have been contaminated with microplastics and heavy metals. The microplastics found were dominated by fibers and LDPE polymers and were small to medium-sized with green, black, and red colors. The digestive tract of fish has the highest accumulation rate of microplastics. The water from station G2 is the most polluted by microplastics. Cd and Pb can be associated with microplastics. The concentration has exceeded the quality standard. The health risk assessment shows that the Gajahwong River is at a moderate risk level, but fish consumption is still relatively safe. Excessive and continuous consumption over the long term can cause detrimental effects. Pollution mitigation must be done immediately.

Key Words: Microplastic, Heavy Metals, Gajahwong River, Fish, Health Risk