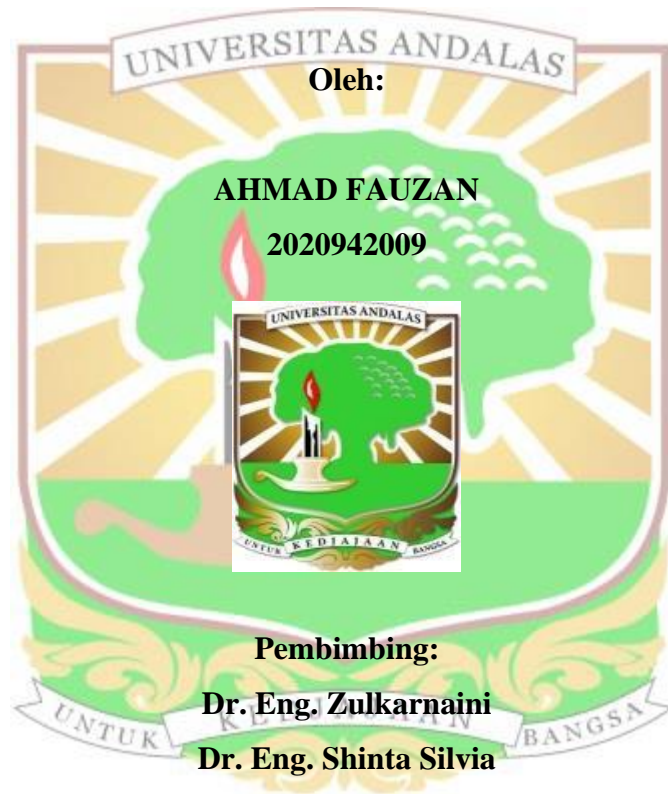


**BIOMONITORING LOGAM BERAT (As, Pb, Hg dan Cd) PADA IKAN
MASAI (*Mystacoleucus marginatus*) DAN AIR
DI SUNGAI BATANG OMBILIN SAWAHLUNTO**

TESIS



**PROGRAM STUDI MAGISTER TEKNIK LINGKUNGAN
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**BIOMONITORING LOGAM BERAT (As, Pb, Hg dan Cd) PADA IKAN
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Ahmad Fauzan, Zulkarnaini, Shinta Silvia

ABSTRAK

Aktivitas penambangan pasir dan emas ilegal, areal bekas tambang, dan industri PLTU di sekitar Sungai Batang Ombilin dapat menghasilkan cemaran logam berat dan terakumulasi dalam tubuh ikan. Tujuan penelitian ini adalah menganalisis kadar logam berat arsenik, timbal, kadmium, dan merkuri dalam perairan Sungai Batang Ombilin dan organ tubuh Ikan Masai (*Mystacoleucus Marginatus*) di sungai. Pengambilan sampel dilakukan secara *purposive random sampling* pada lima lokasi yang mewakili wilayah sungai, yaitu tambang pasir/emas, pemukiman penduduk, PDAM, PLTU, dan bekas tambang batu bara. Kandungan logam berat dalam perairan dan organ tubuh ikan diukur menggunakan ICP-OES (*Inductively Coupled Plasma Optical Emission Spectroscopy*). Hasil pengujian menunjukkan bahwa kandungan logam berat dalam air memenuhi baku mutu Peraturan Pemerintah Republik Indonesia No. 22 Lampiran VI Tahun 2021, kecuali As ($>0,05$ mg/L) dari lokasi tambang pasir dan emas serta Pb ($>0,03$ mg/L) dari lokasi tambang pasir/emas dan bekas tambang batubara. Baku mutu terlampaui pada semua lokasi untuk Hg ($>0,002$ mg/L) dan Cd ($>0,01$ mg/L). Kandungan logam berat As, Pb, Hg, dan Cd pada organ ikan (kepala, isi lambung, dan daging) masih memenuhi baku mutu FAO/WHO 2004. Akumulasi logam berat pada ikan tertinggi terdapat pada wilayah pemukiman. Nilai BCF yang diperoleh untuk As, Pb, Hg, dan Cd secara kumulatif lebih rendah dari nilai BCF. Hasil perhitungan asumsi tingkat risiko dengan nilai As 0,565, Pb 0,451, Hg 0,862, dan Cd 0,539 diinterpretasikan aman dengan nilai $RQ > 1$. Hasil tersebut menyatakan bahwa ikan Masai di perairan Sungai Batang Ombilin aman untuk dikonsumsi oleh masyarakat sekitar.

Kata kunci: Bioakumulasi, ICP-OES, Ikan Masai, logam berat, Sungai Batang Ombilin

**BIOMONITORING OF HEAVY METALS (As, Pb, Hg and Cd) IN MASAI
FISH (*Mystacoleucus marginatus*) AND WATER IN THE BATANG OMBILIN
RIVER SAWAHLUNTO**

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ABSTRACT

Illegal sand and gold mining activities, former mining areas, and the PLTU industry around the Batang Ombilin River can produce heavy metal contaminants and accumulate in the bodies of fish. The purpose of this study was to analyze the levels of heavy metals arsenic, lead, cadmium, and mercury in the water of the Batang Ombilin River and the organs of Masai Fish (*Mystacoleucus Marginatus*) in the river. Sampling was carried out using purposive random sampling at five locations representing the river area, namely sand/gold mines, residential areas, PDAM, PLTU, and former coal mines. The content of heavy metals in the water and fish organs was measured using ICP-OES (Inductively Coupled Plasma Optical Emission Spectroscopy). The test results showed that the content of heavy metals in the water met the quality standards of the Government Regulation of the Republic of Indonesia No. 22 Appendix VI 2021, except for As (>0.05 mg/L) from sand and gold mining locations and Pb (>0.03 mg/L) from sand/gold mining locations and former coal mining locations. The quality standards were exceeded in all locations for Hg (>0.002 mg/L) and Cd (>0.01 mg/L). The content of heavy metals As, Pb, Hg, and Cd in fish organs (head, stomach contents, and meat) still met the 2004 FAO/WHO quality standards. The highest accumulation of heavy metals in fish was found in residential areas. The BCF values obtained for As, Pb, Hg, and Cd were cumulatively lower than the BCF values. The results of the calculation of the risk level assumption with As values of 0.565, Pb, 0.451, Hg 0.862, and Cd 0.539 were interpreted as safe with an $RQ > 1$. These results state that Masai fish in the Batang Ombilin River waters are safe for consumption by the surrounding community.

Keywords: Bioaccumulation, ICP-OES, Masai fish, heavy metals, Batang Ombilin River