

ASSESSMENT OF MERCURY CONTAMINATION IN FISH FROM THE XINGU RIVER BASIN.

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Introduction: Mercury is a metal widely used in illegal gold mining activities, raising significant health concerns for riverine and indigenous populations that depend on fish as their primary protein source. In illegal mining, mercury-contaminated sediment is improperly discharged back into rivers. Through the action of microorganisms, this mercury is converted into methylmercury, its most toxic form, which bioaccumulates in the food chain. Consumption of contaminated fish is the main route of human mercury poisoning, making mercury level monitoring crucial for public health protection.

Objective: To determine total mercury concentrations in fish from the Xingu River basin, assess contamination levels, and evaluate their implications for public health.

Methods and Materials: Fish samples were analyzed using a Lumex RA-915M mercury analyzer with the Pyro-915+ accessory. A total of 100 mg of fish muscle (wet weight) was used for each analysis. The analytical quality of the results was ensured using the certified reference material IAEA-476.

Results and Conclusion: A total of 361 fish samples were analyzed. Of these, 10% exceeded the 0.5 mg/kg limit established by ANVISA for non-predatory fish. The overall mean concentration was 0.25 mg/kg, ranging from 0.001 to 2.80 mg/kg. Although only a minority of samples surpassed regulatory thresholds, all samples showed some level of mercury contamination. These findings are concerning, especially considering that this population relies on fish as its primary source of animal protein, which significantly contributes to dietary exposure to the contaminant. According to the US/EPA, the safe reference dose for methylmercury intake is 0.1 µg/kg/day. Based on the detected concentrations, an adult weighing 60 kg who consumes just 80 g of fish in one day may exceed this dose by up to 37 times. For a 25 kg child, the limit could be surpassed by up to 56 times. These findings highlight a scenario of chronic mercury exposure and underscore the urgent need for stricter environmental regulation and continuous monitoring. Such actions are essential to safeguard public health and food security in vulnerable communities.

Mercury Contamination; Fish Consumption Risks; Methylmercury.