MERCURY FRACTIONATION IN TUCUNARÉ (CICHLA SPP) AND FILHOTE (BRACHYPLATHYSTOMA FILAMENTOSUM) FROM BRAZILIAN AMAZON

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Keywords: GFAAS; Mercury, Metallomic, Amazon, Fish.

Introduction

The Amazon region has a great diversity of water bodies, including not only large rivers and lakes but also numerous streams, which further increase the water volume and the diversity of the ecosystems. These are key factors in maintaining a high diversity of fish in this region. Commercial fishing is concentrated on approximately 40 exploited species, for example, dourada (*Brachyplatystoma rousseauxii*); tucunaré (*Cichla spp.*); filhote (*Brachyplathystoma filamentosum*). In the last decades many papers have discussed the contamination of Amazonian fish by mercury species. Thus, mercury from natural and/or anthropogenic sources entering aquatic ecosystems participates in biogeochemical cycles mediated by microorganisms in which it is chemically transformed, undergoing biomagnification and bioaccumulation in the food chain Thus, predatory fish, which accumulate high levels of mercury, can act as vehicles by which their consumers, such as reptiles, birds and humans, are exposed to this chemical form of mercury [Moraes, et al., 2012; Vieira et al., 2015]. Given the above, this study aimed to determine total mercury in liver and muscle tissue samples and in the protein fraction of these samples in two fish species; tucunaré (*Cichla spp*), and filhote (*Brachyplathystoma filamentosum*) consumed by the population of Porto Velho, Rondônia, Brazil.

Methods

The total mercury determinations in the muscle and liver tissue samples and protein pellets, obtained by fractional precipitation of proteins, were carried out by atomic absorption spectrometry graphite furnace after acid mineralization of the samples, according to the procedure described by Vieira et al. (2015).

Results

The results obtained in the total mercury determination in the samples of liver and muscle tissue and protein pellets are shown in Table 1. It can be observed that the total mercury determinations indicated that the mercury concentration in the liver tissue is about twelve times greater than the concentration of mercury in

muscle tissue and that approximately 80% of the mercury present in samples of liver and muscle tissues are bound in protein pellets with molecular mass (Mm) less than 90 kDa, while the pellets with molecular mass larger than 90 kDa was either not detected the presence of mercury. Thus, it can be inferred that the difference of 20% can be bound in the lipid fraction.

Table 1. Results obtained in the mercury determination in the samples of liver and muscle tissue and protein pellets.

Species	Tucunaré [Hg] ($\mu g\ kg^{-1}$)	Filhote [Hg] ($\mu g\ kg^{-1}$)
Muscle Tissue	101,30±1,30	87,40±0,90
Liver Tissue	1219±15	1044±13,60
Pellet TM	81,20±1,05	72,20±0,94
Pellet TL	999,60±13,10	867,60±11,10

TM – pellet of molecular mass less than 90 kDa of muscle samples; TL – pellet of molecular mass less than 90 kDa of liver samples

Conclusion

The highest mercury concentrations were found in liver tissues and pellets of predatory species of fish, confirming the bioaccumulative process of Hg throughout the food chain. The GFAAS technique proved to be highly accurate to perform the quantification of this metal in biological samples.

References

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