

ANALYSIS OF POPS BY HAIR OF WILD FELINE IN THE RESERVE MAMIRAUÁ

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Introduction

Persistent Organic Pollutants (POPs) are chemical substances persistence that may be found in insecticides, industrial products, and/or by-products derived from combustion processes that are released in to the environment in agricultural areas. These compounds are generally characterized as having the ability to disperse, potential to bioaccumulate, have high lipid solubility, semi-volatile and to biomagnificate. Because they bio accumulative, they have effects on various organs, and may present negative effects to the development and reproduction of animals, which are currently facing the possibility of extinction¹.

Carnivorous mammals deserve special attention due to their position as top consumers in the food chain, for regulating other animal/plant communities, and changes of their populations can lead to profound changes in the structure and functioning of the whole ecosystem.² For this reason, large carnivores are often considered umbrella species. Its preservation can ensure a heated species conservation and the functioning of biological systems. Some cat species are vulnerable to extinction of endangered or threatened. The *Leopardus pardalis*, *Panthera ounce*, *Panthera concolor* and *Leopardus wiedii* found throughout the country mainly in the Amazon region, an environment rich in biodiversity are endangered.

Despite all, there is a break of this interaction between animals and environment that is causing a drastic imbalance in the environmental and structural changes of the various communities found in nature. It is believed that it is caused by various human activities such as the removal of vegetation and habitat fragmentation, hunting, fires, mining, and cutting selective timber. In the Brazilian Midwest region, the Cerrado and the Amazon rainforest are highly fragmented biomes and as a result of this pressure; hence, there are significant reductions in chances of felines biodiversity maintenance³.

The objective of this study is to determine the concentration of POPs in hair samples of the following wild feline: *Leopardus pardalis*, *Leopardus wiedii*, *Panthera concolor*, and *Panthera ounce* collected in the Mamirauá reserve, Amazon, Brazil.

Materials and methods

The samples of hair from *Leopardus pardalis* (n = 1), *Panthera ounce* (n = 1), *Panthera concolor* (n = 1) and *Leopardus wiedii* (n = 3) were collected in Mamirauá reserve (AM).

The samples were weighed and 10 mg were subsequently subjected to acid hydrolysis in 4 M HCl at 40 ° C for 24 hours. After hydrolysis, 4 ml of the mixture was placed in Hexane: dichloromethane (4: 1, v/v) and submitted to centrifugation to discard aqueous phase. The organic phase was submitted to a column of silica and eluted in an acid solvent of hexane: dichloromethane (4: 1, v / v). After, samples were evaporated under a N₂ atmosphere.

After evaporation, an internal standard (50mL of TCMX) was added to the sample. Then, the samples were analyzed through gas chromatography coupled to the masses. Blank samples were also created in the same conditions.

Analyses were performed in a Agilent gas chromatography coupled to a mass spectrometry with a column DB-5 (60m X 250µm X 0,25 µm). Injection was splitless at 265°C, and the oven program was the following: 90°C (1 min); 150°C (10°C.min⁻¹); 240°C (3°C.min⁻¹); hold for 5 min; and then 300°C (10°C.min⁻¹) and hold for 5 min. Blanks were performed to evaluate interferences. The recovery of POPs from the method(s) on average validation was 85 %.

Results and discussion

After the analysis the results are summarized in Table 1 below.

Table 1. Analyses for quality and quantity of POPs in hair samples of wild felines

Samples	POPs(ng/g)					
	g-HCH	pp-DDT	Metoxiclolo	Mirex	Aldrin	op-DDT
<i>L wiedii</i>				64.76		
<i>P concolor</i>	0.74	22.45	2.47	21.05		
<i>P onça</i>		0,65294		17.65	22.15	
<i>L pardalis 1</i>				15.91		
<i>L pardalis 2</i>	0.55	8.69	1.90	22.35	22.94	1.77
<i>L pardalis 3</i>			52.19	14.52	22.13	6.95

Upon the completion of analysis, one may observe the presence of Mirex in all of the felines. The concentrations found are of values that are generally considered to be high. The Mirex is an ant, used for controlling leaf-cutting ants from *Atta* and *Acromyrmex* that can cause damage to a wide range of agricultural crops and forest plantations that are widespread in rural areas of Brazil. However, Mirex (sulfluramide), can be very persistent in the aquatic environment, becoming a potential contaminant for birds and small mammals. This is of importance because Felines feed off of these birds and small mammals. As well, Mirex is excreted slowly and may accumulate in various organs such as the liver. This can affect the development and reproduction of these wild felines⁴.

Thus these species are endangered by deforestation for agriculture and cattle against these environmental problems but as well as the contamination of POPs can contribute on this issue by preventing the reproduction of these animals and others that serve as food for them, occurring fragmentation of forests and the consequent genetic isolation of these populations⁵.

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