

# POISONING OF WILDLIFE IN ENVIRONMENTAL PARKS OF BRAZIL

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## Abstract

The city of Anapolis located in the state of Goiás, Brazil, has several environmental parks that serve as habitat and refuge for many wild animals. The parks represent the last refuge for some wild animals such as marmoset, possum, armadillo, capuchin monkey, owl, lapwing, among others. In addition, the parks play an important role for climate mitigation and preservation of the ecosystem and represent an important recreational area for residents. Recently, mortality rates have increased in non-human primates, including capuchin monkeys and marmosets, as well as skunks from environmental parks such as Ipiranga, Matinha, and Central Park. Based on history and clinical signs - rapid onset, tetanic seizures and pupils dilated -strychnine poisoning was suspected. Necropsies were done in 15 marmosets (*Callithrix penicillata*). Of a total of 13 marmosets from Central Park, nine showed petechiae in the pancreas, and presence of green strychnine-laced grain in the digestive tract. However, marmosets from Matinha and Ipiranga parks showed no specific necropsy lesions. Monitoring of Central Park showed that it must undergo reform. The hypothesis was that the employees were poisoning the marmosets since the animals constantly stole employees' meals. Thus, an environmental education program was held in all three parks of the city. Employees and visitors of the parks were instructed about importance of wildlife conservation and biodiversity maintenance. A positive result was obtained after the introduction of an education program, since then no more animal deaths have been observed in the parks.

**Key words:** Brazil, *Callithrix penicillata*, environmental parks, strychnine, virus.

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## INTRODUCTION

### *Environmental Parks*

The Environmental Parks are spaces generally formed by contiguous areas, institutionalized in order to preserve and conserve the flora, fauna, and water as well as the geological, cultural, and natural beauty. It also helps preserve recovering degraded ecosystems, promoting sustainable development,

among others factors that contribute to environmental preservation.

The creation of these parks is of fundamental importance for the preservation of ecosystems, providing scientific research, management and environmental education in the pursuit of environmental conservation.

The loss of all this biological diversity reduces the capacity of ecosystems to withstand the pressures increasingly

constant human impacts, or natural, and perform efficient cycling of energy and nutrients, thus enhancing the destruction of these ecological systems. In addition to many species of biomedical and economic interest becoming extinct, some of them yet to be discovered. In order to control the increasing loss of biodiversity, we've created a number of areas of nature conservation in Brazil, called Environmental Parks.

Besides its importance in biodiversity conservation process the Environmental Parks can become an important area of human awareness about the environmental problems of today, through environmental education, they offer learning opportunities with a combination of formal and informal techniques, facilitating the increase of knowledge and changes in values. Furthermore, with environmental education, environmental parks can be an important tool in raising awareness about environmental conservation for the people living around these areas.

Some people feel discouraged by the high level of destruction of species that exists in the world today, but on the other hand, it is also possible to feel challenged faced with the need to do something to prevent such destruction. The coming decades will determine how many species survive. Efforts now spent to save the species, establish new conservation areas and protect parks, determine which species will be preserved and which will be extinguished.

#### *Threats to biological diversity*

A well-preserved environment has great economic, aesthetic and social value. Keep it means preserving all its components in good condition: ecosystems, communities and species. The most serious aspect of the environmental hazard is the extinction

of species. Communities can be degraded and confined to a limited space, but to the extent that the original species to survive, will still be possible to reconstruct the community. Likewise, the genetic variation of species will be reduced if the population size is decreased, but they can still recover their potential genetic variation through mutation, natural selection, and recombination. However, since the quenched species is the only genetic information contained in DNA and their special combination of characters that it has, they are lost forever. Once a species has been extinct, its population cannot be retrieved, the community she lived becomes impoverished and its potential value for humans can never be realized (FRANKHAM et al. 2008)

#### *Extinctions*

To preserve species successfully, providers should identify human activities that affect the stability of populations and lead the species to extinction. You also need to determine the factors that make one vulnerable to extinction.

The global diversity of species has reached an unprecedented level in the current geological period. The most advanced groups of organisms - insects, vertebrates and spermatophytes (flowering plants) - reached their highest diversity about 30,000 years ago. However, since then, the number of species has declined as the human population increases. Currently, no less than 40% of total net primary productivity of the terrestrial environment is used or abused in some way by human populations (PIMM 2005); this represents about 25% of the total primary production on Earth.

#### *Poisoning*

Poisons lead the ranking of abrupt deaths and small animals are more vulnerable to this type of danger. The most common poisonings occur with anticoagulant rodenticides, rat killers and strychnine (DE ALMEIDA 2002). In Brazil, a 1980 decree prohibits products containing strychnine that is listed in Anvisa's list of banned substances in the country. However, there are places that commercialize the poison illegally.

## **Materials and methods**

Autopsies were performed on the Zoonosis Control Center of Annapolis Prefecture according BRAZIL (2005).

Autopsies were performed on 15 *Callithrix*, one from the Environmental Park Ipiranga, one from Park Matinha and 13 from Central Park in the city of Anapolis, Goias from February 2013 to August 2013.

During the autopsies of the 15 *Callithrix* were evaluated organs such as the pancreas, liver, kidney, heart, brain and spleen.

### **a) Necropsy**

The animal was positioned supine with the head turned to the left side of necropsista. a large longitudinal incision was made on the skin along the midline of the body, from the chin to the genitalia. Snapped up the skin and examined lymph nodes, looking nodules known as "bubo". We observed the same size, comparing volume difference between the right and left side. Continuing, opened the chest cavity using a knife. Proceeded to the section and removal of the sternum. presence was found content (blood or clear fluid, fluid or cloudy, flaky) and withdrew the lungs and heart. the observed features were described and collected fragments for examination and histopathology of viral isolation.

The opening of the abdominal cavity was performed through the linea alba incision. There was a presence of content in the cavity (Photo 1). Was removed spleen, stomach, liver (vital for the diagnosis of yellow fever) and kidneys.

**Photo 1 Incision of the Alba line and check the presence of content in the cavity.**



He held court median on the skin of the forehead (between the eyes) to the base of the head. The skin was removed and all muscles surrounding the skull. With a saw, there was a cross-section in the frontal bone above the eyes and symmetrically in the lateral direction, on both sides, about 1-2 cm above the ear (Photo 2). Remained cut continuity to the back of the animal's head. Introduced a knife tip at the incision of the frontal bone and levered upward and backward folding bone cap. Using scissors, proceeded to release the brain's connection with the meninges. To remove the brain and cerebellum, they bowed their heads and were cut vessels and nerves from the base. Consequently, by gravity action, the brain can be easily extracted.

**Photo 2 Cross section in the frontal bone of *Callithrix***



the lowest 1.0 x 0.5 x 0.5 cm brownish

- Two fragments of liver, measuring 2.0 x 1.5 x 0.5 cm and 1.0 x 1.2 x 0.6 cm both with smooth, dark-brown, soft consistency. The cuts, no macroscopic changes.
- Spleen fragment measuring 2.0 x 0.7 x 0.5 cm gray color and no obvious changes.
- Kidney fragments measuring 2.0 x 1.5 x 1.0 cm with smooth, dark-brown, with detachable capsule. To cut no obvious macroscopic changes.

## Results

Of the 13 primates from Central Park, nine were rescued still alive by the Zoonosis Control Center team presenting excessive salivation, tearing, nasal discharge, increased respiratory sounds by bronchoconstriction, shortness of breath, pulmonary edema, diarrhea, decreased heart rate, pupil constriction, coughing, vomiting, frequent urination, and incoordination. Then they appeared to have muscle tremors, spasms, as well as hyperactivity. The animals died within two days. The death occurred due to respiratory failure and asphyxia (paralysis of the respiratory muscles).

At necropsy we found lesions such as petechiae on the pancreas, we also found the digestive content to have a pigment from and indicator indicating strychnine poisoning.

- Brain slices, heart, liver, spleen and kidney were removed to be evaluated histologically:
- Brain fragment measuring 1.2 X 1.0 X 0.5 cm, white and softened
- Two heart fragments spanning the larger 1.5 x 1.0 x 0.5 cm and

Population of Annapolis had various allegations of poisoning and rescue requests of marmosets in Environmental Parks during the months of February and August 2013. We conducted necropsies of the animals in the Animal Control Center for diagnosis of poisoning and Yellow Fever.

The *Callithrix* of the three Environmental Parks of Annapolis showed no positive reaction to the yellow fever virus, thus indicating that they were not carriers of the Yellow Fever *Silvestre*.

Animals from Matinha and Ipiranga showed no signs of poisoning. Of the 13 *C. penicillata* from Central Park, nine showed evidence of poisoning by strychnine.

## Discussion

After monitoring Central Park, we found that it needed reform. We suspected the marmosets were being poisoned by the workers because they were taking the workers' meals. We held environmental education seminars in the three City Parks informing workers and visitors of the importance

of animal biodiversity and how they endangered them by feeding them.

We obtained a positive result from this work, as there were no more deaths of animals in the parks.

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