

REPORT TO AMPHIBIAN ARK OF THE PROJECT:

Conservation of *Scinax akatraz* (Anura: Hylidae): Captive breeding and *in situ* monitoring of a critically endangered tree-frog species



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EXECUTIVE SUMMARY

Scinax alcatraz is a tree frog, endemic of Ilha dos Alcatrazes and is listed as “Critically Endangered” on the International Union for the Conservation of Nature (IUCN) Red List. Part of this island belongs to the Brazilian Navy, and it is used as an artillery target. This practice often causes spot fires on the island which can destroy the bromeliads, the habitat of the *S. alcatraz*. For this reason the establishment of an *ex situ* breeding program, as well as maintaining a viable population in captivity, was really necessary. For that reason, in 2008 the FPZSP started a captive conservation program with this species. However, before working directly with the critically endangered species it was necessary to do a management and husbandry protocol with a surrogate species, *Scinax perpusillus*. After two years working with the surrogate, it was time to apply the techniques developed for the *S. alcatraz*. The founders were collected on October 2011 and were placed in a biosecure room inside of FPZSP facilities. In January 2011 we had the first breeding of *S. alcatraz*. The fund received from AArk was used to buy materials for the biosecure room. Parallel to the captive program, constant monitoring of the species will be conducted to enable the investigation of possible population declines, and if necessary, the genetic and sanitary viable population of *S. alcatraz* maintained in captivity will be ready for some possible supplementation or reintroduction.

1. INTRODUCTION

Scinax alcatraz (Lutz 1973) is a member of the *perpusillus* group (family Hylidae), which is characterized by species with a life cycle restricted to bromeliads (Peixoto 1987). This species is endemic to Ilha dos Alcatrazes off the coast of São Paulo, Brazil, and is listed as “Critically Endangered” by the International Union for the Conservation of Nature (IUCN) Red List (Rodrigues and Cruz 2004).

Ilha dos Alcatrazes (135ha) is the main island of Alcatrazes Archipelago (24° 6' S 45° 42'O), which is located about 35 km from the coast of São Sebastião (SP). The archipelago is inserted in the Tupinambás Ecological Station (SP), under the current administration of ICMBio (Instituto Chico Mendes de Conservação da Biodiversidade - *Chico Mendes Institute for Biodiversity Conservation*), however, part of the main island belongs to the Brazilian Navy, which uses it as a training target.

Due to a limited natural range, *S. alcatraz* is susceptible to threats that can easily decimate the population, such as natural disasters or the introduction of new diseases or predators. Moreover the use of the Island as an artillery target by Brazilian Navy (Bataus 2011) can easily destroyed the habitat of this species as has already happen in the past. Measures to minimize the impact during the training season were agreed between the researchers and the Brazilian Navy, but the only way to eliminate this major threat to this population is the completely end of this practice, which is already being discussed. For all this treats, the establishment of an *ex situ* breeding program, as well as maintaining a viable population in captivity, has been deemed necessary (IUCN 2002; Zippel and Mendelson 2008).

Scinax alcatraz has never been maintained in captivity, so we conducted a pilot study utilizing *Scinax perpusillus* as a surrogate (Lisboa and Vaz 2012). After 2 years of captivity, learning and developing management and reproductive techniques with the surrogate species, we were able to start the conservation program with the endangered one. Herein we present the management and preliminary results of the maintenance of *S. alcatraz* in captivity.

2. FIELDWORK

In October 2011, it was conducted a 5 days expedition to Ilha dos Alcatrazes which was sponsored by Tupinambás Ecological Station. The main goal of this expedition was to continue the conservation Action Plan of the island, which gathered researchers from different branches of activity, including our project that is to monitor the population of *Scinax alcatraz* and to collect the founders to the *ex situ* conservation program.

Material and personal equipment were disinfected prior the field trip to prevent the carrying of continental diseases to the island. Samples from the wild population were taken to investigate the presence of *Bathrachochytrium dendrobatidis* in the island, but we do not have the results yet.



The tadpole's survey was conducted at daytime, looking for them into the water deposited in bromeliads axils. However, we did not find any tadpoles, probably because the rainy season had not started yet and many bromeliads were dry. The adult's survey was conducted at nighttime by active calling search in areas with abundant bromeliads. It was collected 5.3.3 specimens of *Scinax alcatraz*, which became the founders of the *ex situ* program. During the days we had spent at the island, and during the transportation process, the specimens were held in cups with water and leaves.



3. *EX SITU* PROGRAM

Prior the fieldwork, it was prepared a biosecure room to receive the founders. An old room inside the FPZSP dependences was refurbished and the biosecurity model was followed from Amphibian Research Center (www.frogs.org.au).

The facility consists in a section for permanent housing of the animals, one for culturing live foods, and a bathroom to shower. It is necessary to take shower before and after the management with the animals and everything that goes inside the room has to be disinfected before. The husbandry equipment was bought with the funds from AArk grant, as discriminated in the attached table.



At the end of the fieldwork expedition, the founders were transferred directly to this biosecure room, on 29 October 2011. On the next day in captivity, 2.1.0 animals were found dead. We believe this death was caused by stress from many days of expedition and from the long trip, which took 5 hours by boat and 4 hours driving. After this episode, no other founder died until this date (June 2012).

Adults were maintained in glass enclosures, with plant for refugia and water dish. The water offered for the animals receives a treatment with carbon filter and UV light. UVB lighting was provided with the use of a single 20 watt Exo Terra® Repti Glo 5.0 Compact Fluorescent bulb fixture in each enclosure.

The adults were divided into two enclosures: one housing a male/female pair and the other housing 2 males and 1 female. The 3 juveniles were maintained for 2 months in the same plastic cup it was used in the transportation because they were too small and could run away from the aquarium.

Adults and juveniles were offered 2-3 days hatched crickets (*Gryllus* sp.) dusted with Repashy Superfoods Calcium Plus ICB® vitamins twice weekly. The food was provided

directly on the aquarium floor or, when the floor was inundated, crickets were offered in a plastic cup to prevent drowning.

3.1. Breeding and tadpoles rearing

On 22 December 2011 an ultra-sonic fogger was used to increase the nighttime humidity and to stimulate breeding (Lisboa and Vaz 2012). It was turned on every night, but alternating between the adult's enclosure. After 33 days, the first breeding event occurred on the enclosure housing 2 males and 1 female. The female deposited around 140 eggs.

Most of the eggs (around 110) were deposited in the water at the floor of the aquarium; around 20 were deposited on the plastic cups with the plant, and 2 on the glass. Eggs were found in clusters of 2, 3, 4, 5, 7, but mostly alone (different as observed with *Scinax perpusillus* which the eggs was mostly in cluster of 3-4, and rarely alone) (Lisboa and Vaz 2012).

All eggs were maintained in the enclosure until hatching. From a total of 140 eggs, 132 tadpoles hatched and at this date 93 juveniles are being maintained. After this first breeding event, the fogger was no longer used.

Upon hatching, tadpoles were housed communally in a plastic enclosure filled to a depth of 3 – 4 cm with treated water and no substrate. Alcon® Spirulina Flakes were mixed with water and offered daily and water was changed daily too.

Upon emergence of all four limbs, tadpoles were transferred to a tilted plastic cup, with less water. No substrate was provided and no food was offered during the tail absorption period. Upon completion of metamorphosis, froglets were maintained in groups of 4 to 7 individuals in this plastic cups and then was maintained on aquariums similar to the adults, in groups of 14 - 20 animals. Newly hatched crickets were offered daily or every other day dusted with Repashy Superfoods Calcium Plus ICB® vitamins.

4. CONCLUSIONS AND NEXT STEPS

The husbandry and reproduction of *Scinax perpusillus* has proven successful in the pilot study and the skills acquired during this process (2 years and 6 months) were really necessary to applied for the threatened species, *Scinax alcatraz*. It was used exactly the same protocol developed with *S. perpusillus* and only in 3 months in captivity *S. alcatraz* reproduced. As was observed with the *S. perpusillus*. the high humidity produced by the fogger stimulates the start of the breeding activity for our captive population. Also, as has happened with the surrogate, even being a bromeligenous species, that specific clutch site was

not essential in captive breeding once the animals found viable spots that replaced the bromeliads (Lisboa and Vaz, 2012).

After this first successful experience with *S. alcatraz*, new researches will be conducted with the captive population in order to guarantee that it is really a safe alternative to recovery wild population. The next intended researches to be conducted are related with genetic viability, sanitary protocol, microbiota comparison and cryopreservation. As well, the monitoring of wild population and the evolvement with the Action Plan of the Alcatrazes Island will be continued.

LITERATURE CITED

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ATTACHMENTS

TABLE 1: LIST OF MATERIAL ACQUIRED WITH FUNDS RECEIVED FROM AARK			
QUANT.	ITEM	UNITARY VALUE	TOTAL VALUE
1	AIR CONDITIONER	R\$ 864,00	R\$ 864,00
1	WATER SUPPLY FILTERING SYSTEM	R\$ 879,00	R\$ 879,00
5	TANKS (35x35x40cm)	R\$ 318,00	R\$ 1.590,00
5	TANKS (45x 45x60cm)	R\$ 400,00	R\$ 2.000,00
11	LIGHTNING	R\$ 61,10	R\$ 672,10
1	ULTRASONIC WATER FOGGER (LARGE)	R\$ 398,00	R\$ 398,00
2	ULTRASONIC WATER FOGGER (SMALL)	R\$ 136,00	R\$ 272,00
1	DIGITAL PRECISION BALANCE	R\$ 1.040,00	R\$ 1.040,00
1	DIGITAL CALIPER	R\$ 130,00	R\$ 130,00
1	TERMOHYGROMETER	R\$ 63,00	R\$ 63,00
			R\$ 7.908,10