OBSERVATIONS ON THE MAINTENANCE AND REPRODUCTION OF *PYTHON CURTUS*.

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INTRODUCTION

Good specimens of the blood python (*Python curtus*) are colourful and impressive members of the python group. Despite their moderate size (1.5-3 m), bright colours, and large numbers imported over the years, they remain fairly uncommon in zoos and private collections. This is due to several factors, including a nasty temperament, reluctance to feed in captivity, and a high death rate. Consequently, there has been only sporadic reproductive success in captivity. Even when successful, the adults would often succumb to respiratory infections during winter cooling, and eventually die or become "poor-doers". In the author's opinion, most of these conditions can be remedied by proper husbandry. This paper will explore some of the major factors that limit the animal's occurrence in captivity and some successful methods for correcting these problems. Finally, observations are made on the successful breeding and reproduction of *Python curtus*.

NATURAL HABITAT

While many keepers of *Python curtus* have failed to

maintain them in a healthy state for even a few months, others have kept them for years without problems (Paine, 1982). The fact that they flourish in their native habitat, as witnessed by the fat, robust imports, suggests that usual conditions for maintenance of other python species in captivity may be unsuitable for this species. The first logical approach to keeping these animals is to study their existence in the wild for clues to their specific needs. They are native to the Malay Peninsula, Borneo, and Sumatra (Schmidt, 1957). Their ecological niche is generally ponds, rivers, and other aquatic areas. Here they lie near the edge of the water, often buried in mud and vegetation with only the head showing, waiting for their prey of rodents and birds to chance by. Near the equator, the temperature averages 27^{0}C al all the year round, with only 1-2^{0}C fluctuations between seasons and 3-5^{0}C fluctuations between day and night. Rainfall is high, and humidity is usually above 80% and remains above 70% even during the "dry" season. The monsoons of November and December comprise the coolest part of the year, and probably corresponds to their breeding season. Daylight averages 12 hours throughout the year. Based on these findings, the captive environment was set up to mimic their native habitat, yet at the same time, allow for ease of cleaning and maintaining sanitary conditions.

HANDLING

Several of the *Python curtus* received by this writer were supposedly quite vicious. While many thrashed while handled, bites were rare. When the animals were grabbed behind the head, they would often try to bite or defecate. On the other hand, by sliding the hands along the floor of the cage and beneath the animals, they were quickly and

gently lifted and removed from the cage before they could prepare to bite. Surprisingly, even the mean animals soon settled down when picked up in this manner, and most became quite docile. This method of handling resulted in much more manageable snakes. If the animals keep crawling, it is a simple matter to place an open hand below the anterior portion of the body until they settle down.

FEEDING

There are many techniques for attempting to induce blood pythons to feed (Bowser, 1979), yet many captive animals end up starving themselves and dying. Some of the methods employed have been quite elaborate, such as creating a miniature swamp to induce feeding. The author has refrained from such set-ups and all specimens eventually fed. As a blood python is a heavy-bodied animal with a slow metabolism, a healthy animal can fast for several months with no ill effects and little loss of body weight. Therefore, avoid force-feeding as it may further disturb the animals and keep them from feeding.

Generally, blood pythons are not as aggressive feeders as most other species of pythons. Successful feeding is closely associated with optimum temperature, humidity and hiding areas. Yet, it is the author's opinion that the real keys to inducing feeding in reluctant animals are patience, non-disturbance, and the offering of a wide variety of food. Too often, the owner tries too hard - disturbing the animals, fighting with them, force-feeding, and possibly frightening them from feeding, perhaps forever.

Let the animal become accustomed to its enclosure. Usually, the animal will begin to rest with its head looking out from the hiding area. Then, offer

a rodent or bird every several days. Do not frighten or tease the animals, nor leave live food items unobserved for they can injure or frighten the python. Dead or harmless food items should be left in the cage overnight, as many blood pythons refuse food immediately but will eat several hours later.

All blood pythons kept here eventually fed. The longest fast was five months. A nice red animal, which had not fed for over a year, was given to the author as a last resort. Countless food types and cage set-ups including a "swamp" environment had been tried without success. Two days after arrival, a live gerbil was offered, and the snake exploded from the hide box, killed it and ate it. Live gerbils had never been offered. Another specimen that had refused rats and chicks started feeding on dead rats that had the heads rubbed in chick viscera. The blood python's favourite food is probably baby chicks, and some will refuse everything else. Once feeding, most will expand their diet to rodents and/or birds. Most feed best at dusk and into the night.

The animals in my collection were fed every 1-2 weeks depending upon their body weight, being careful to maintain a good body weight without inducing obesity. The diet consisted of dead rats and occasional thawed two week old chicks. The rats are sprinkled with Vionate and Theralin about once a month. The author feels that it is important to have the gastrointestinal tract of the food animal full of nutrients, so newborn chicks are not utilized. The rats are fed Wayne Lab Mix.

In summary, after temperature, humidity and security (hiding) areas requirements have been met, patience and experimentation with various food items are additional factors often necessary to induce voluntary feeding.

CAGING

Animals were maintained individually in 30x120x60 cm (hxwxd) wooden cages with plexiglass fronts. Nylon mesh screens, 6x10 cm, on either side of the cage provided ventilation. The screens were able to be covered to any degree with 4 mm thick plastic (Visqueen) if necessary, to alter temperature and humidity. Each specimen was originally provided with a wooden hide box proportional to its size. This was later replaced with shredded, unprinted white paper which allowed the snake to burrow beneath it and hide wherever it wished. If only a single hide box was offered, the animals would invariably retreat into it, even at the expense of optimum temperature and other environmental needs. The floor of the cage was covered with newspaper.

Shredded paper has several advantages over sphagnum moss, shavings, and other materials. It is more sanitary, is less likely to be ingested, and is easily removed from a feeding area. It can be liberally placed in the cage, deep enough for the animals to hide with only their heads exposed, waiting for their next meal. A large plastic bowl is provided for water. The cages were misted heavily once daily, but the snakes themselves were not misted to prevent their cooling by evaporation.

TEMPERATURE, HUMIDITY AND LIGHTING

Light was provided by natural sunlight through windows. The photoperiod thus varied with the seasons and day length in this area (Colorado). Heat was generated by thermal stack, 48 Watt porcelain heat bulbs controlled by a wafer thermostat to within 1^0 of setting. There were two heat bulbs per cage. One bulb was wired to an outside photo-

cell that automatically turned on at dawn, off at dusk. The second one, with a lower temperature setting remained operational at all times. Heat bulbs were placed to allow a 1.5°C thermal gradient in the cage. The temperature was maintained at 27.5-30°C during the day and 26-27.5°C at night. The humidity varied between 65 and 80% year round.

CYCLING AND BREEDING

During the period reported, two pairs of snakes were of adequate size and age for breeding. On 27 October, the temperature was dropped to 25.5°C during the day and 23°C at night. This regime was maintained for three weeks. A female going into shed was only cooled to 25.5°C both day and night.

To initiate breeding, the males were introduced into the females' cages. The red pair mated on 8, 9, 10 and 19 November, and 28 December. The orange pair, the female of which was only slightly cooled, mated on 8 November and 12 and 18 December. Both pairs often maintained copulation for the entire day. On 14 November, the temperatures were raised back to normal levels.

Following breeding, a heating pad wired to a rheostat was placed under the females' cages to allow a spot of extra warmth if so desired. The temperature on the pad was approximately 32°C. The females would usually rest next to the hot spot generated by the pad but not directly above it. The orange female never appeared gravid. The red female fed on 13 December and then refused food. Her overall body weight was a bit on the thin side. She began to appear heavy in the posterior third of her body in early February. She shed on 6 March, 1983. On 6 April, she was found coiled around fifteen fertile eggs and one golf ball sized infertile egg mass.

Foto 1. *Python curtus*. Foto: R. Opferman.

Foto 2. *Python curtus*. Foto: R. Opferman.

EGG AND HATCHLING CARE

The eggs were removed from the female, weighed and measured, and placed in two clear plastic sweater boxes (see photos). They weighed from 90-100 g and were 140-160 mm in length. Vermiculite and water in a 1:1 ratio by weight was used as a substrate in one cage. Sphagnum moss soaked and then firmly squeezed to remove excess water was the substrate in the second cage. Sphagnum moss was also used to lightly cover both groups of eggs.

The two boxes were placed in an incubator and maintained at either 31 or 30.5°C (Ross, 1978). Eggs incubated at the higher temperature hatched on 5-7 June; the second group hatched on 9-11 June. All fifteen eggs hatched (see photos) producing 11.4 healthy juveniles. Each box produced two females. The hatchlings ranged between 90-105 g and 33-37 cm in length. The eggs weighed 140-160 g just prior to hatching.

Hatchlings were maintained individually in sweater boxes, with paper towels as substrate.

A hide box and bowl of water were also provided. Holes were drilled in the top of the boxes (approximating a pegboard) for ventilation. It was at least three weeks before any of the animals shed. All refused weaned mice or pink rats for the first month. These observations seem to be the normal patterns for blood python hatchlings. The author has lost track of five of the babies, but the other ten are doing well.

DISCUSSION

Pyhton curtus can be a valuable addition to any collection. They can thrive in captivity for many years, providing their specific needs are met. They do well at warm temperatures and fairly high humidity. The animals are found in the wild in

areas of constant temperature and wet environment. Too cool temperatures and too low humidity probably cools and dries the lung tissue and predisposes the animals to respiratory problems. Prevention of infections is imperative, for they are also prone to antibiotic toxicity, especially from the aminoglycosides (Ross, 1981). It is therefore best to refer to published antibiotic dosages for this species before attempting antibiotic therapy. Excess cooling and too low humidity must be avoided, especially during shipping and shedding, as they are more sensitive than most other species. Ventilation should also be adequate to prevent the animals from breathing stagnant air.

Almost all animals will feed once the necessary environmental conditions, seclusion, and preferred food is provided. Once adapted to their surroundings and feeding well, they should be able to be cycled for reproduction. Coming from a warm climate, it seems minimal cooling is needed to induce fertile matings. This has been borne out by other enthusiasts, notably Lawrence (1982). Egg incubation and care of young is similar to that of most pythons.

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