CAPTIVE PROPAGATION OF THE EMERALD TREE BOA *CORALLUS CANINUS*

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INTRODUCTION

This paper reports successful breeding of *Corallus caninus* in two successive years. The project began in the summer of 1985, with parturition occurring in 1987 and 1988, respectively.

The male *Corallus caninus* was obtained from an animal dealer in the spring of 1984. The animal was approximately 122 cm in length, and posed no feeding problems. It accepted small rats from forceps.

In June of 1985, I acquired two females from Ernie Wagner. They had been collected in Surinam some time in 1984. These animals were well acclimated and accepted dead rats from forceps.

One of the females lacked any of the typical white vertebral stripes, and was a uniform green color overall. This animal was 167 cm in length and will be referred to as animal #1. The other female was 180 cm in length and was typical in coloration, herein referred to as female #2.

HOUSING

The male was housed in a 470 liter aquarium, 183x46x56 cm. The females were housed in a 61 cm dimater by 76 cm high hexagonal aquarium. In the 470 liter aquarium, branches were affixed to the side of the aquarium using a clear silicon sealant. The hexagonal aquarium had PVC branches 5 cm in diameter mounted at different heights in the tanks.

Thermal gradients were made available to all three snakes by using 2 incandescent bulbs (red 25 Watt/110 V) which provided 'hot spots' that reached 27.7 to 31°C. Room windows provided a natural photoperiod. Fluorescent lights (Vita-Lites, 30 watt/110 V) were used to provide additional illumination for the females.

Air temperatures in the cages varied from 22 to 28°C depending on the time of day. Pine shavings were used as a substrate the majority of the time. Gravid females near parturition were housed over blank newsprint as a substrate. Water was offered in several locations in both cages. The animals would frequently drink from bowls that were on the cage floor, even though water was available in bowls suspended from the branches.

BREEDING

On September 9, 1986, a climate change was initiated. At dusk the snakes and the cages were misted for approximately four to five minutes. The heat source was then turned off. Over a period of several hours the cage temperatures were allowed to drop to 22°C (Walsh, 1987). Each morning the heat source was turned on and cage temperatures returned to 27.7°C. This was continued until Novermber 15. The snakes' activity significantly increased during the early evening hours. Although no records were kept of snake activity, it is my clear impression that the male exhibited larger activity in crements than did either females. The snakes were misted briefly in the morning with water that was cooled in the refrigerator (Laszlo, 1983). The male shed on September 24. Food was offered on September 25. Two medium-to-small rats were consumed. Female #1 went opaque and then shed on October 2.

That evening, after their normal mistings, female #1 was placed in the male's cage, and she remained there for five days. The male commenced courtship almost immediately, as indicated by the male flicking his tongue faster and more frequently than normal. He used his spurs to rub and scratch along the females sides. This differs from that reported by Groves (1978) for *Corallus caninus,* but coincides with observations made by Murphy (1981) on *Candoia bibroni.*

The female seemed very receptive to the male. Courtship lasted from 1 to 3 hours during several episodes between October 2 and October 7. The male positioned himself along one side of the female, until their cloacas were aligned. When this happened, the female's vent opened even before the males hemipenes were observed (cf Gillingham et al., 1977). Once the males hemipenes were inserted, he would wrap his tail in a tight knot around her tail. Her tail would hang down, but did not seem to wrap around his. Courtship and copulation was always observed taking place on the branches. Once copulation had started, there was very little movement. Copulation would last several hours, but by morning they were always separated, and coiled in their typical fashion. Cage temperatures during copulation were between 22.2 and 23.8°C.

Female #1 was removed from the males cage on October 7, 1986. The male remained alone until the evening of October 9, 1986, when female #2 was introduced to his cage. Female #2 had gone through ecdysis on October 6, 1986. As with female #1, male courtship began almost immediately. Copulation was observed with #2 at 9:55 pm. Again, by morning they had separated. Although females were left with the male for several days, the most active breeding activity occurred within the first 24 hours of introduction. Only one female was introduced into the males cage at a time (Murphy & Campbell, 1987), and the females were alternated between October 2 and November 12. Copulation was observed with #1 on October 2, 5, 12 and 13. Copulation was observed with #2 on October 9, 18 and 19.

During this entire period the male refused to feed. The females continued to feed regularly. No further copulations were observed, until November 11, 1986, which occurred with female #1. This was the last observed copulation until parturition. Females accepted food every eight days. Mistings were discontinued, and cage temperatures were returned to 24.4 to 28.8°C, at which time the male began feeding again.

GESTATION

By the end of December 1986, there was a mid-body swelling in both females (Walsh, 1978). Both females became very passive. Once it was determined that the females were gravid, they were housed together for the duration of gestation in the 470 liter aquarium. This aquarium provided the thermal gradients I suspect to be necessary for successful gestation. At this time the male was removed from the 470 liter aquarium and housed in the hexagonal aquarium.

Cage temperature during gestation was maintained at 24.4 to 28.8°C, with 'hot spots' of 27.7 to 31°C. Both females chose to remain in the hottest spot offered in the cage. Occasionally, during the night they would become active and roam about the cage for short periods of time. Food was still offered every 8 to 9 days.

Both females continued to feed throughout December 1986, and on into January 1987. Female #1 refused her first meal on January 10, 1987. She also refused food on January 15, 22 and 26. On February 1, 1987, she was going into shed, completing the process on February 22, 1987. This was to be her last shed before giving birth. Female #2 fed until the first week of February. She then refused on February 5 and 11, 1987. She shed what was to be her last shed (before giving birth) on March 1, 1987. Food was offered to both females after their sheds, but was refused on all occasions. Water was placed in bowls situated on the branches next to the gravid females. Both females were observed drinking water frequently. Females became very passive during gestation, when disturbed, they would prefer to hide their head in their coils.

Towards the end of May, female #1 became more active, and was observed spending more time in the slightly cooler (26.6 to 27.7°C) area. Her resting coil was more relaxed than usual and she appeared to be very uncomfortable. By the second week in June, the mass in her body had shifted noticeably towards the cloaca. She was more restless during the night, but by morning was resting in one place.

PARTURITION

On June 21, 1987, 259 days after the initial copulation, at approximately 8:30 am, she became increasingly more active, moving about the branches of the cage. Just before giving birth she passed a pellet of uric acid. At 9:15 am an unfertilized egg was passed followed by 10 neonates and one more unfertilized egg. By 9:45 am parturition was completed.

Female #2 was undisturbed by female #1's parturition activity. She was not observed during parturition. On June 27, 1987 sometime between 10:15 pm and 1:30 am #2 also gave birth to 10 neonates and 2 infertile eggs. Female #1 had one baby that was born prematurely (i.e. the yolk was not fully absorbed). The yolk sac became infected, and this baby was lost. Both females resumed feeding the day following parturition. Females were again offered medium-sized rats every 8 to 10 days.

In 1988 both females bred again under conditions identical to those described above. Female #1 gave birth on June 21 to 8 neonates and 8 infertile eggs. Female #2 showed all the signs of pregnancy but resumed feeding in late July, with no resultant neonates.

NEONATES

Neonates were maintained individually in one gallon jars (Murphy & Campbell, 1987), with plastic dowels for perches, and 6.35 mm of water on the bottom. Jar temperatures were maintained at 26.6 to 28.8°C. During the first few days, several neonates (1987 litters) inadvertedly became over-heated, when jar temperatures reached 32°C as a consequence of a faulty thermostat. Two neonates inverted their hemipenes. Similar hemipenal inversions due to high neonatal temperatures were observed by T. Walsh (pers. comm.).

Unfortunately, the present cases went undetected for several days, and by the time they were discovered, the hemipenes had become swollen. The neonates were soaked in cool water and sugar was applied directly to the hemipenes to reduce swelling. The hemipenes had been inverted too long, and this was not successful. These two males ultimately lost their hemipenes, but otherwise continued to thrive.

A similar incident happened again in 1988 but was detected within hours. The same procedure was used, and proved successful. No problems with neonates were encountered at temperatures of 26 to 27°C.

The neonates first ecdysis occurred 16 to 18 days after birth. No shedding difficulties occurred. In 1987 no attempts were made to feed the neonates before their first shed. In 1988, 2 neonates accepted pink mice before their first shed. Pink mice were offered from forceps, but only several neonates accepted food in this manner. Live pink mice were left in the jars overnight and most neonates accepted these prey. A few had to be assisted by placing the pink mouse into their mouth (Groves, 1978). Generally, these neonates would then constrict the pink mouse, and swallow it. After several feedings these neonates began to feed on their own.

CONCLUSION

Successful breeding of *Corallus caninus* is made much more feasible by using healthy, well-acclimated specimens, preferably captive-born, as breeding stock. Animals should be housed in cages that can be easily serviced with minimal disturbance. A climatic cycly involving temperature fluctuation appears to stimulate females to ovulate, and males to copulate.

The importance of temperature fluctuations to induce copulation cannot be over-emphasized. Indeed, it is likely that *Corallus caninus* can be induced to breed any time during the year by providing a climatic change (Murphy & Campbell, 1987; Laszlo, 1983).

Gravid females showed a strong preference for heat. It is recommended that gravid females be kept in cages that afford a thermal gradient with local 'hot spots' of 31°C.

Neonates are sensitive to high temperatures and should be maintained at 26 to 28°C. Temperatures above 32°C can cause inversion of the hemipenes in male neonates, a condition which is correctable if detected and treated immediately.

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PRODUCTS MENTIONED IN THE TEXT

Vita-Lite: fluorescent tubes manufactured by Duro-Test Corporation.

REFERENCES

Gillingham, J.C., C.C. Carpenter, B.J. Brecke & J.B. Murphy, 1977. Courtship and Copulatory Behavior of the Mexican Milk Snake, *Lampropeltis triangulum sinaloae* (Colubridae). The Southwestern Naturalist 22 (2): 187-194.

Groves, J.D., 1978. Observations on the Reproduction of the Emerald Tree Boa, *Corallus caninus*. Herp. Review 9 (3): 100-102.

Laszlo, J., 1983. Further Notes on Reproductive Patterns of Amphibians and Reptiles in Relation to captive Breeding. In International Zoo Yearbook Vol. 23: 166-174. London: The Zoological Society of London.

Murphy, J.B., & J.A. Campbell, 1987. Captive maintenance. In Snakes: ecology and evolutionary biology: 165-181. Seigel, R.A., J.T. Collins & S.A. Novak (Ed.) New York: Macmillan Publishing.

Walsh, T., 1978. Husbandry and Breeding of *Corallus caninus* at the National Zoological park, with notes on Thermoregulation of Gravid females. Unpubl. Man. 21 pages.