

## H U S B A N D R Y

# Emerald Gems (*Corallus caninus*): Captive Husbandry and Propagation

## Part III: Propagation

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Photographs by the author.

The first two installments (*Iguana* 13(1): 37–41; 13(2): 133–137) proposed a set of guidelines for the habitat preparation, acquisition, maintenance, and diet of Emerald Tree Boas. Part three presents some of the more technical details associated with propagation.

### Breeding and Reproduction

Imported shipments of *Corallus caninus* have been observed to contain gravid specimens most frequently during the months of March and April and again during September and October (the latter is considered the most common for parturition). For this reason, these snakes are thought to breed more or less opportunistically on a year-round basis. Other possibilities for such an extensive birthing season might include sperm retention or the ability for females to delay ovulation until environmental conditions are optimal. September through November in the Amazonian Basin is the hottest and driest time of year. This also is when most herpetoculturists begin entering eligible animals into breeding trials. Beginning in early to mid-October, two weeks prior to initial introduction, temperature cycling should be initiated. Breeders should begin raising the daytime high (DTH) and dropping the nighttime low (NTL) temperatures at a rate of 1 °F every third day, continuing until a 15 °F differential has been established. Once these levels have been reached, but prior to introduction, misting should begin for all prospective breeders. Those who regularly mist as part of their husbandry regime should increase the frequency and duration of each session by 50%. Other keepers should initiate two daily

misting periods of 3–5 minutes each at dawn and again at dusk. The sprayer setting should deliver a medium-sized water droplet, resembling rain. Atomized droplets are not appropriate. Misting should be maintained for three days, after which males should be introduced into a female's enclosure, with lights on, on the morning of the fourth day. The pair should receive the first misting immediately.

In cases where individual animals are unfamiliar to each other or are breeding for the first time, interest between prospective mates may take several days to develop. Pairs should be allowed to remain together for a period of three days, separated again for another three, then re-introduced. These periods during which pairs are separated can be used to offer meals. Ideally, animals should feed continuously throughout the season, although this rarely occurs for many males.

The use of multiple males in breeding (polyandry) is believed to be beneficial. The presence of competitors may increase testosterone production levels, thereby augmenting instinctive breeding behavior. Females may instinctively embrace



*Corallus caninus* copulation.



An Amazon Basin female eating a still-born neonate.



A litter of neonate *Corallus caninus*.

polyandry as a form of insurance against genetic incompatibilities. One study of a colubrid snake showed that females that practiced polyandry and subsequently produced multiple-sired litters, retained greater postpartum body weight and delivered larger overall litters. A less scientific personal observation suggests that not all males are created instinctually equal. In essence, it takes two to tango, and, if one of the dancers is unwilling, being able to call in an understudy may well increase the likelihood that the show will go on.

In cases where multiple males are employed, the second male should be introduced immediately upon removal of the first. At the end of this pairs' three day interval, the female should be allowed an equal period of recuperation prior to beginning the cycle anew.

Both temperature cycling and pair-rotation should be continued for as long as breeding activity is observed. However, actual breeding behavior may not be observed or recognized. In such instances, breeding trials should be continued throughout the season. One additional environmental stimulus reported to be effective at virtually any time of year is direct exposure to a drop in barometric pressure, such as those that often precede the onset of a thunderstorm. Such exposure is commonly reported to evoke immediate breeding responses from males that had previously been



Neonate *Corallus caninus* vary in color, but the green adult coloration appears only later.



Breeding behavior known as "barber-poling."

slow to respond or shown little interested in breeding. I have personally observed virtually every sexually mature male in my colony begin cruising and scent-marking his perches at such times.

May marks the end of the breeding season, and, at this time, pairs should be separated, misting stopped, and reverse temperature cycling initiated. The same cycling protocol is used in reverse until maintenance-level DTH and NTL levels have been re-established.

#### Ovulation, Parturition, and Postpartum Maintenance

In the case of gravid females, the onset of ovulation (the discharge of mature ova from the ovaries) follows some time after the cessation of breeding activity. Although no recognized timeframe seems to govern its onset, the peak of this activity is usually unmistakable. Most often females appear to grow exceedingly uncomfortable and begin to display notable midbody swelling. Less frequently, a female may go through the process unnoticed, but these instances are exceptional. In such cases, the subsequent behavior patterns associated with gravid females are often sufficient to tip the breeder as to what has occurred. During ovulation, which lasts anywhere from three to seven days, most females will continue to give an impression of extreme discomfort, often hanging grossly distended midbody loops off their perch. Within 30 days of peak ovulation, females will become opaque, indicating the onset of the post-ovulatory shed (POS). From the date of actual sloughing, females average 138 days to parturition. Some breeders prefer to provide females with a constant 90 °F-basking spot, while others, I for one, do not vary from the regular maintenance cycle. To date, experimentation with both methods has produced no apparent differences in resultant litter size, size or sex ratio of the offspring, or time from POS to parturition.

Because *C. caninus* is a livebearer, births tend to be somewhat messy affairs that rarely seem to occur at convenient hours of the day. Therefore, I recommend that on POS day 125, the water bowls be removed from the birthing enclosure and that thrice-daily misting be used instead to supply the female with water for drinking. Directly spraying the animal's body ensures that it will become aware of the moisture being provided and lessen the chance of it becoming dehydrated. Rarely, an animal that is accustomed to using a drinking bowl may begin showing signs of dehy-



Breeding behavior in which the pair is tightly intertwined is called "cuddling."

dration. In these instances, a large flat dish containing no more than 1/4" of water can be introduced. Newborn emeralds not fully broken free from their egg sacs at birthing may be inadvertently dropped into water bowls and subsequently drown.

Litter sizes average between eight and eleven (as few as 1 and as many as 22 have been recorded) and newborns should be active and, in the best case scenario, have no sign of an external umbilicus. Neonates should be gently wiped clean of amniotic fluid using a damp paper towel and clear 75 °F-tap water, and subsequently placed in small individual containers, supplied with a water dish and a perch no greater than 5/8" in diameter. Most babies will enter into a shed phase within two weeks of birth. Keepers should resist the urge to feed newly shed babies, as it takes as long as 30 days for a baby to deplete its supply of internal yolk. Two weeks after the initial shed, feeding trials can begin. Most breeders prefer to begin trials employing thawed pink rats that have been repeatedly dipped in hot water until they register a temperature of 115–120 °F, a process I refer to as "superheating." My preference is to use live Siberian Dwarf Hamster crawlers (approx. 8 g). To date, this method has never failed to inspire neonate emeralds to do what nature intended. Their suitability for this task is unsurpassed in my experience and, when



Parturition is frequently a messy affair in this live-bearing species.

practical, I highly recommend their use. This is perhaps one of the most valuable tidbits of information that I can offer prospective *C. caninus* owners. When all else fails, these little guys will get the job done. Current captive-born survival rates are thought to be the inverse of those found in the wild, meaning that over 80% of all babies conceived and born in captivity should survive long enough to be given an opportunity to reproduce.

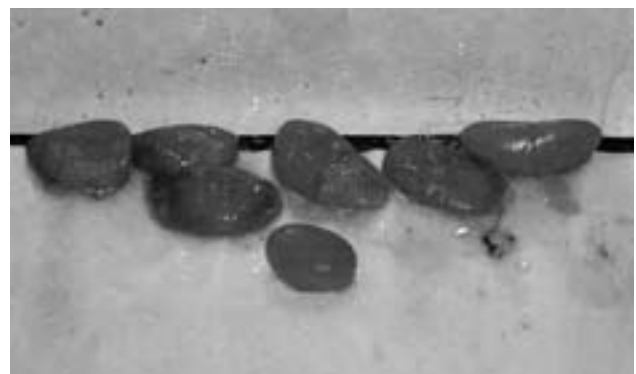
The reconditioning of postpartum females should begin immediately. Females who have completed the cycle should be offered food the night after parturition. These animals must begin to regain their conditioning as quickly as possible in order to avoid the onset of illness triggered by opportunistic pathogens. Since some females flatly refuse to feed from the onset of ovulation until after parturition, the sooner they are offered a meal and begin the process of recovering, the less susceptible they will be. Females should be bred bi-annually, giving them a full year of recovery before beginning the process anew. In her lifetime, a properly maintained female can remain viable for many years and is capable of delivering over 100 babies.

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#### References

- Garner, T.W.J. and K.W. Larsen. 2005. Multiple paternity in the Western Terrestrial Garter Snake, *Thamnophis elegans*. *Canadian Journal of Zoology* 83: 656–663.
- Laszlo, J. 1979. Reproductive patterns of reptiles in relation to captive breeding, pp. 22–27. In: P.J.S. Olney (ed.), *International Zoo Yearbook*. The Zoological Society of London, Dorchester.
- Lofts, B. 1978. Reptilian reproductive system and environmental regulators, pp. 37–43. In: I. Assenmacher and D.S. Farmer (eds.), *Environmental Endocrinology*, Springer Verlag, Berlin.
- Olsson, M. and T. Madsen, T. 1998. Sexual selection and sperm competition in reptiles, pp. 503–564. In: T. Birkhead and A. Møller (eds.), *Sexual Selection and Sperm Competition*. Academic Press, Cambridge, Massachusetts.
- Ross, R.A. and G. Marzec G. 1990. *The Reproductive Husbandry of Pythons and Boas*. Institute for Herpetological Research, Stanford, California.
- Zeh, J.A. and D.W. Zeh. 1996. The evolution of polyandry I: Intra-genomic conflict and genetic incompatibility. *Proceedings of the Royal Society of London B*, 263: 1711–1717.



Infertile ova are discolored and shrunken.