Captive Care of North American Colubrid Snakes

(King Snakes, Rat Snakes, Indigos, Hognoses, Garters, Water and Others)

Client Handout from the: *Journal of Herpetological Medicine and Surgery, Vol. 10, Iss. 3 & 4, 2000*

HOUSING

1. Most colubrid snakes can be housed in smooth sided cages such as glass aquariums, or fiberglass snake cages. Wooden cages are not advisable for long-term housing. Cages should be as long as the snake and the width should be one half the snake's length. Outdoor snake enclosures also work excellently.
2. Several substrates (bedding material) can be utilized. Indoor/outdoor carpet works extremely well, especially for those snakes which eat fish. Other snakes will do well on a variety of wood chips. These include cypress mulch, pine bark mulch, and aspen bedding. Cedar chips are not recommended due to the aromatic which they contain. These compounds may be very irritating to a snake's respiratory system or skin. Combinations of

wood chips on one side of a cage and moist sphagnum moss or soil on the other side may be necessary for some of the smaller snakes. This gives the snake a needed choice of substrate type.

3. Water should be provided at all times in a smooth water bowl that is not easily tipped over. Alternatively, water may be provided twice weekly for several hours each time. This is especially useful when cage ventilation is poor.

4. A hide box or some other area(s) should be provided for every snake. These boxes provide needed security for snakes, and may help to reduce stress and therefore disease.

5. Rocks, branching sticks, and other cage additions provide environmental enrichment, and are very useful to snakes in terms of providing additional exercise. Dimly lit plastic boxes void of anything but substrate are poor substitutes for mother nature, and are not considered satisfactory snake habitats.

6. A ventral heat source is considered essential for normal digestion, reproduction, and immune system function. A heating pad should be kept “on” at the low setting, and placed under one side of the cage (not in the cage). Hot rocks should generally not be used. A “hot spot” of 24-29°C (85-95°F) should be provided, and the rest of the cage may be allowed to fluctuate from 22-27°C (72-80°F).

7. Screen or plastic coated hardware cloth tops are ideal for snake cages because they provide very good top ventilation. This is critical to prevent moist, stagnant air from building up in the cage, thereby resulting in skin or respiratory infections. Pegwood and wooden tops with holes drilled in them are generally not suitable since they do not provide good ventilation.

8. Humidity must be maintained at appropriate levels. This varies for snakes depending upon their preferred habitat, but a general rule of thumb is that most snakes do well in a humidity range of 60-90%. Desert snakes do well with drier air, while those from moist mountain meadows or swamps may do well with air which contains more moisture. A better alternative than maintaining high humidity in the entire cage is to provide a high humidity retreat, termed a “humidity box”. This is a plastic box of appropriate size into which sphagnum moss or other moisture containing substrate has been placed. The lid is placed on the box with a hole barely large enough

for the snake to get in it or out that is placed on either end or on the lid. These boxes may also be utilized as “egg laying boxes” during breeding season.

9. Additional lighting does not appear to be essential for most colubrids but is probably helpful for their well being. Filtered natural sunlight or fluorescent lights may be all that is required. Incandescent bulbs, placed above the screen top, are beneficial for those snakes which enjoy or need to bask. The length of light provided daily may match that which naturally occurs in most temperate zones, and allowed to fluctuate seasonally. Thus 12-14 hours of daylight are suitable during the summer, while 10 hours or less may be all that is required during the winter. Snakes being hibernated at temperatures just above freezing require no light at all during this time, but references should be checked for the species in question.

10. Cages should be cleaned and disinfected regularly. An excellent disinfectant which is widely available and inexpensive is standard household bleach. An effective concentration is 1 part bleach to 30 parts water or roughly 1 ounce of bleach per quart of water.

11. These are general guidelines for housing colubrid snakes. Certain colubrids are highly aquatic and need to be housed in a water filled cage (with modifications). This does not include our common water snakes or garter snakes however, but it does include swamp snakes, Seminatrix pygaea and crayfish snakes, Regina sp., mud snakes and rainbow snakes, Farancia sp. Other colubrid snakes require drier habitats since excessive humidity can result in anorexia, vomiting, dermatitis or a respiratory infection. These include the desert rat snakes, Bogertrophis sp., desert king snakes, Lampropeltis getula splendida, gray-banded kingsnakes, L. alterna, and several other smaller species. For these species, one may wish to provide water intermittently.

12. Many individuals and species do not tolerate handling well. It is considered stressful for a nervous or very small snake to be handled frequently or in some cases at all. Therefore, frequent handling of snakes should be restricted to those larger and calmer species or individuals, and only as necessary for other animals.

FEEDING

Most large colubrids will consume pre-killed mice and rats. Even the juveniles of these species will usually consume pinkie or fuzzy mice and rats. While live mice and rats will often be taken, they can injure the snakes, and therefore, during feeding times, the rodent should be monitored carefully and removed if not consumed within a half an hour. Frozen rodents may be used as long as they have been thawed out properly, and have not become rotten internally. It is suspected that frozen rodents will retain much of their nutritive value for up to six months, based upon research done by the beef and poultry industries. Artificial supplementation of rodents with vitamins and minerals has not been shown to cause an increase in the growth or reproductive potential of snakes consuming them. Feeding most colubrids once weekly is usually sufficient. Calculations of the energy requirements of snakes suggest that a snake weighing 0.5 kg (1 pound) could survive on 20-40 mice per year. However, certain kinds of snakes such as whipsnakes and racers appear to require nearly twice as much food in order to achieve normal growth and reproduction. Hatchlings or recently captured adults of many of these species such as mountain kingsnakes may often start feeding on another food item such as a lizard, and then can be switched to mice over time, by scenting mice with the preferred prey item.

There are many colubrids that will not consume rodents. Colubrid snakes are known to specialize on a variety of prey items including lizards, other snakes, amphibians, fish, crayfish, worms, slugs, insects, spiders, centipedes, and even scorpions. Several North American colubrids such as scarlet snakes, Cemophora coccinea and leaf-nose snakes, Phyllorhynchus sp. appear to consume only the eggs of other reptiles, which can be difficult to procure. Mud snakes and rainbow snakes, Farancia sp., while large and beautiful snakes, are specialized feeders on aquatic salamanders and eels respectively Hence, those considering ownership of these types of snakes need to research both the diet and captive environment of these snakes prior to acquiring

them. One of referred to one of the detailed references on North American snakes.

REPRODUCTION

Only healthy appearing snakes should be used in breeding programs. Prior to successful reproduction, a pre-breeding winter cool down period termed brumation or hibernation is advisable. This usually requires a minimum of ten weeks at temperatures between three and 13°C (37-55°F). During this time the snakes can be housed in their regular cages and offered water only. Food should be withheld for approximately two weeks prior to cooling.

Approximately two weeks after the end of the winter cool down, the female snake, with her recently shed skin, should be placed with the male snake. The male will usually initiate the mating process immediately. If not, remove the female and try again every one to two weeks until mating is observed. If not mating is observed, double check to make sure that the snakes have been properly sexed. Mating is evident when one observed one of the male hemipenes inserted into the cloaca of the female. The pair may mate repeatedly over day or weeks.

Egg Layer – Approximately 30-45 days later, depending upon the species, the female will lay eggs. This usually follows a pre-laying shed by 14 days. This shed will serve as a reminder to place an “egg laying box” in the cage. This consists of a plastic box with a hole cut in the lid large enough for the gravid snake to enter. The box should be filled with moistened sphagnum moss, or some other moisture holding agent, such as peat moss. If she accepts the box she will spend a great deal of time in it and ultimately lay her eggs there. The eggs are then transferred to an “incubation box”, which can be another plastic box with no holes and a tight fitting lid. This box may contain a vermiculite/water mixture (50/50 by weight or approximately 1/3 cup of water to one cup of vermiculite). Other incubation mediums have been successfully utilized, including perlite, sand and even moistened paper towels, but vermiculite is the one we are most familiar with, and therefore, that which we strongly recommend. The lid is removed every two to three days in order to allow some air exchange. The eggs hatch in 50-110 days depending upon the species and the incubation temperature. No external heat is necessary if the eggs are placed in a warm location such as the upper shelf of a closet where temperatures may range from 24-29°C (75-85°F). The babies will often pip and

remain in the eggs for up to two days while they adjust to breathing and absorb their yolk. Do not disturb them at this time and allow the snakes to emerge from their eggs before collecting them and moving them to their individual cages. Young snakes will usually refuse food until after their first shed, which may occur 7-14 days after hatching. Double or triple clutching has been reported in some colubrids, and this refers to a female laying two or three clutches per season. With North American colubrids, this usually only happens when females are fed very heavily. We do not advise attempting it on a regular basis. All of the very popular colubrids are egg layers. This included the king snakes, rat snakes, hognose snakes, and indigo snakes, but also many less well known species such as glossy snakes, longnose snakes, leafnose snakes, shovelnose snakes, lyre snakes, night snakes, hooknose snakes, black-striped snakes, cat-eyed snakes, worm snakes, mud snakes, rainbow snakes, and ringneck snakes.

Live-Bearers – The gestation period for live-bearing colubrids generally ranges from 90-120 days, although there are exceptions. The most well known live-bearing snakes are the garter snakes and water snakes, but there are many other species. Brown snakes, earth snakes, red-bellied snakes, swamp snakes, crayfish snakes, and lined snakes are also known to be live-bearing snakes. Be prepared to place an “egg laying” box in the cage for of these species since they will use it as a den in which to give birth. The high humidity will also be very helpful for the neonates, which will shed very soon after birth. Remember that success with these neonates will depend on separating them from each other and giving them a selection of wet and dry substrates, as well as warm and cool areas. The keeper must offer food of appropriate size frequently, as often as every other day to some of these small snakes.

COMMON MEDICAL PROBLEMS

Gastrointestinal parasites are extremely common in recently captured colubrids. Not only should initial fecal exams be performed, but fecal exams should be performed every three months for the first year in captivity and then every six months to a year afterwards. Appropriate dewormings should be performed by a veterinarian.

A veterinarian experienced in reptile medicine should be consulted for the following conditions in colubrid snakes:

- *Anorexia*

- *“Blister disease” – vesicular dermatitis – blisters on the skin*
- *Constipation*
- *Diarrhea*
- *Dysecdysis – difficult shedding*
- *Dyspnea – difficult breathing*
- *Dystocia – egg binding*
- *External parasitism- mites or ticks*
- *Masses – lumps or bumps*
- *Mild abdominal swelling*
- *Mouth lesions, redness, swelling*
- *Internal parasitism*
- *Trauma created by rodent bites or bites from other prey items*
- *Seizures and muscle tremors*
- *Ventral dermatitis – skin lesions and sores*
- *Vomiting*
- *Trauma – cuts, scrapes*
