

CAPTIVE HUSBANDRY AND REPRODUCTION OF THE LEOPARD SNAKE *ELAPHE SITULA*

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INTRODUCTION

The Leopard snake, *Elaphe situla*, is a small species of ratsnake but an attractive and sought after species all the same. Most adults only average 90 cm to 1 metre in length, females often being slightly longer than males and heavier built. Two basic pattern forms occur - spotted and striped, but depending upon the parents used for breeding programs both pattern forms can emerge from a single clutch of eggs.

My breeding group of *Elaphe situla* were obtained in June 1989 and were given to me by Achilles Dimitropoulos of the Herpetological Department of the Goulandris Natural History Museum in Kifissia, near Athens in Greece. These snakes comprised of a single adult female (spotted) and two adult males (striped), plus a hatchling male (also striped). At the time that I obtained these snakes I was in the middle of building new terraria and it was several weeks before I could devote the attention that these snakes required at that time. Once the new terraria were completed I made the mistake of keeping these snakes at temperatures that were too high for them (28° to 30°C) but it took me some time before I figured out why they would feed only occasionally. The young Leopard snake was not as badly affected, and then in September the larger of the two adult males escaped never to be seen again.

In October the remaining adult male and female looked quite thin, but I had corrected the temperature in their terraria and reduced it to 22°C to 25°C and at least the female began to feed a little more often. I also discovered that for adult Leopard snakes the size of the mouse you offer them is crucial - too large or too small and they often shy away from it. The adult male still refused food, and assist-feeding and force-feeding proved to be fruitless because moments after feeding him in this way he would regurgitate the mouse. Instead I began to feed him on rat pups through a pinky-pump syringe, and he began to accept food in this way, and I increased his body weight enough for him to be hibernated for several months. The female and the young male were hibernated also.

The following spring (1990) these snakes emerged from hibernation and all began to feed voluntarily, much to my relief. After sloughing several weeks later the adults were placed together and I suspect that they mated on one occasion, but the female did not conceive and no eggs were laid.

Having discovered that the adults preferred temperatures between 22° and 25°C they were maintained in separate small terraria on newspaper with a cardboard tube, a large flat slate resting on the tube to provide another shelter and a small dish of water. Both would accept small furred mice of two to three weeks old, and the younger male began to take increasingly larger prey as he grew, being maintained under identical conditions to the adult pair but in a slightly smaller cage.

The adult pair became sporadic feeders again in late July, and this persisted until late September - this is a trait of my Leopard snakes which manifests itself around the same time each year. However, by October they will usually feed quite regularly again before being hibernated.

CAPTIVE BREEDING

My first success in breeding from *Elaphe situla* came in 1991, and since then I have bred from them every year. On the first occasion they emerged from hibernation in March, began to feed within a few days and then entered a slough. In early April they had sloughed and were being introduced to one another - typically I would place the male in the female's cage. The only mating witnessed took place on April 6th 1991, but other matings almost certainly occurred.

The female continued to feed on one or two small mice each week until mid-May, by which time she was about to enter the pre-laying slough and it was evident that she was gravid. She sloughed on 28/5/91 and then became very restless. A container of damp peat was provided and she eventually laid three eggs on 9/6/91 - 65 days after I had seen her mating. Two of the eggs were very large but the third was considerably smaller. The eggs were then incubated at 28°C on damp peat in a 2 litre plastic container. The largest egg proved to be infertile after several weeks of incubation, but the other two completed



Foto 1: *Elaphe situla*. Volwassen vrouw, gevlekte vorm uit Griekenland.
Adult female, spotted morph from Greece.

Foto: Kevin J. Hingley.



Foto 2: *Elaphe situla*. In gevangenschap geboren jong, gestreepte vorm. Ouderdieren waren gevlekte vrouw en gestreepte man uit Griekenland. Captive bred baby, striped morph. Parents; spotted female and striped male from Greece. Foto: Kevin J. Hingley.



Foto 3: Een langwerpige ei karakteristiek voor *Elaphe situla* waaruit een gevlekt jong tevoorschijn komt. A typical elongated egg of *Elaphe situla* containing a spotted baby before hatching fully. Foto: Kevin J. Hingley.

incubation and after 60 days the smaller egg hatched on 7/8/91 to reveal a striped female hatchling of about 25 cm in length. The other, larger egg hatched the following day to reveal a spotted female hatchling of around 30 cm in length.

The two babies were placed in separate boxes and kept at 25°C, and after sloughing only the larger spotted baby began to feed. The smaller striped baby eventually had to be assist-fed with pink mice for several weeks until it finally began to feed on its own accord. The spotted female hatchling was retained for my breeding program and the striped female hatchling was given to another snake keeper in exchange for a pair of young *Elaphe scalaris* he had given to me the previous year. Sadly this keeper discovered the striped youngster dead in its water bowl some months later, apparently having drowned.

From this time onwards, by ensuring that the temperature at which these snakes are exposed to does not become too high and also by offering mice of a suitable size, I have not had any problems with the feeding of my specimens. In 1992 the older adult pair bred again and the female laid three eggs, all of which hatched after 62 to 63 days of incubation at 28°C. That year the young were all of the striped pattern morph and all proved to be males. None were retained. In 1993 the same adult pair bred successfully to produce two young of the spotted pattern morph and one of each sex. The younger pair (wild caught young male from 1989 and captive bred female from 1991) also mated but nothing came of this.

In 1994 both pairs mated again but my older female produced three infertile eggs. I suspect her usual partner, the older male, to be the reason for this because in 1993 and 1994 I had to introduce the younger male to the older pair in order to prompt the older male to court and copulate with the older female. After first chasing and biting the younger male (which I would then remove) the older male would then mate with the older female. Fortunately in 1994 the younger pair bred successfully and three fertile eggs were laid by this female. All of these eggs hatched to produce two spotted male babies which were perfect but also a badly deformed striped youngster which died soon after hatching and was not sexed. In 1995 I will only use the younger male with both females, and if the older female produces fertile eggs and healthy offspring I think I will have to consider the older male to be past his prime as far as breeding from him is concerned and begin to search for another younger male.

GENERAL COMMENTS

There do not appear to be many keepers of *Elaphe situla* and especially keepers whose specimens breed every year. Considering that certain wild populations of this species are in decline (Tkachev, 1993) it is extremely important that every effort is made by Leopard snake keepers to encourage annual breeding successes.

From the specimens that I have worked with so far it would appear that providing they are reasonably healthy to begin with, and these snakes are then maintained at reasonable temperatures (22° to 25°C) and suitably sized prey is offered to them, then it is possible to breed from them each year. Of course, captive bred specimens are likely to be less problematical and it is better to purchase these than to encourage the collection of wild caught specimens, especially on a large scale. In the past few years I have noticed that fewer and fewer Leopard snakes of any description are to be seen on sale at the Snake Day event in Utrecht, and this I have discovered because I have had to buy some in Holland in order to provide enough captive bred *Elaphe situla* for people in England who have asked me to supply them with these snakes.

At English reptile fairs there are rarely any Leopard snakes offered for sale at all. Is the problem with the keeper rather than with the snakes that are being kept as far a captive breeding this species is concerned? My recommendations are to individually house each adult Leopard snake in a small terrarium measuring around 30 x 20 x 20 cm, maintain them at 22°C to 25°C from March to November and hibernate them between November and March at 10°C. Do not handle these snakes frequently because they are nervous and in my experience are best left alone unless it is essential to handle them (such as for cage cleaning). Always provide something for them to hide in or under - a cardboard tube with a flat slate resting upon it provides two hiding places, and always make sure they have fresh water.

You can tell if a Leopard snake is too warm because (a) it usually refuses to feed, and (b) it may sit in the water bowl to cool itself down. These snakes also take to the water if they have mites on them in order to drown these parasites. If your Leopard snakes spend a lot of time in the water bowl and are refusing to feed the chances are that their cage temperature is too high, or if the temperature is OK and they are feeding then they probably have a mite infestation.

My specimens regularly become erratic feeders (females) or stop feeding altogether (males) in late July through to September. I no longer worry about this and ensure that they feed every week (except when sloughing) from the time they emerge from hibernation up to this summer fasting period, and then in autumn prior to the next period of hibernation. Gravid females often refuse food after the pre-laying slough has taken place, but usually resume feeding after egg-laying.

Sickly wild caught specimens which will not feed on their own appear to accept food from a pinky pump more readily rather than whole, small food items pushed into their mouth or throat. Babies which refuse to feed by themselves will normally accept food placed in their mouth. Leopard snake babies are quite big and often they are two weeks old before they accept their first meal, so if you breed this species don't become too anxious if they do not accept food immediately.

REFERENCE

- Tkachev, D., 1993. Distribution and biology of *Elaphe situla* in the Crimean Peninsular, notes on keeping in the terrarium. *Litteratura Serpentina* (English Edition), Vol. 13, No.4, August 1993, pp 128-130.