

**THE CHINESE LEOPARD SNAKE,
ELAPHE BIMACULATA (K.P. SCHMIDT, 1925)
AN EASY SNAKE TO KEEP**

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INTRODUCTION

As indicated by the title, this article refers to the Chinese Leopard snake *Elaphe bimaculata*. Until recently this snake was frequently imported but now it is bred regularly and has therefore gained in popularity. On the basis of literature and my own experiences in keeping this animal in a terrarium, I will attempt to give a picture of this, in my opinion, ideal terrarium animal.

DESCRIPTION AND RANGE

Elaphe bimaculata is a relatively small snake which resembles in form and length the Leopard snake (*Elaphe situla*). The females reach a average length of 90-100 centimetres. Males stay smaller and reach 80 centimetres. Apart from their length, the sex can also be noticed by the form of the tail. In males the tail shows a clear thickening just behind the cloaca; this is caused by the hemipenes. The snakes have 188-207 ventrals and 23 dorsals (Staszko, 1994). They have a wide range of colour and markings. Schulz (1986) gives three different types of colours/markings:

- 1: Ground colour is yellow brown with four longitudinal dark brown stripes, beginning on the neck. Within these stripes there are chestnut brown bordered spots. Near the neck, the markings of the head merge with the markings on the back. In both the male and the female the scales on the anterior part of the body are smooth: posteriorly they become slightly keeled. The head is rather small.
- 2: Ground colour is yellow, with four longitudinal dark brown stripes that begin on the neck. Within these stripes there are red to red-brown spots which have black borders. These spots often join together on the snakes back. The black borders are often less clear than on colour type 1. Similar to type 1 the markings on the head merge with the markings on the back. In females the scales are slightly keeled whilst males have scales that are smooth on the anterior part of the body but become slightly keeled posteriorly. Males have smaller heads whilst females have a somewhat broader head.



Foto 1: *Elaphe bimaculata*. Vrouw (vorm 3). Female (morph 3).
Foto: C.M. Langeveld.



Foto 2: *Elaphe bimaculata*. Jong na de eerste vervelling (vorm 3).
Young after first slough (morph 3).
Foto: C.M. Langeveld.

3: Ground colour is grey yellow-brown to olive. On the back there are brown to red-brown but usually red, dumb-bell shaped spots which can become stripes on the tail. On the sides there are round spots with black borders similar to the spots on the back. The markings on the head usually merge the markings on the back. The scales of both sexes are smooth, but may be slightly keeled in some places. The snakes usually have a small head. This type resembles *Elaphe situla*, particularly the dorsal surface. Bartz (1989) distinguished two kinds of markings which corresponded to type 2 and 3 of the Schulz (1986) categories.

Elaphe bimaculata has a limited distribution range in central China. According to Zhao (1993) the snake can be found from eastern Sichuan to Jiangsu, and north to Hebei. In his appendixes he mentions the following provinces where the snake appears: Hebei, Shandong, Henan, Shaanxi, Sichuan, Anhui, Jiangsu, Hubei, Zhejiang and Jianxi.

According to Pope (1930) and Maslin (1950) - as quoted by Schulz (1986) - *Elaphe bimaculata* lives in medium elevation mountain regions and avoids flat land. The diet of this snake consists of rodents, reptiles, birds and their eggs.

ELAPHE BIMACULATA VERSUS *ELAPHE DIONE*

Elaphe bimaculata is closely related to the Steppe Snake *Elaphe dione*. According to Zhao (1993) *Elaphe dione* lives in the same area as *Elaphe bimaculata*, except for the provinces of Hubei, Zhejiang and Jianxi. The 'Chinese' *Elaphe dione* closely resembles *Elaphe bimaculata*. In habitats where both species occur, interbreeding is possible (Schulz, 1986). To distinguish both species Schulz gives the following differences:

- 1: *Elaphe bimaculata* has 8-10, seldomly 11 lower labial scales: *Elaphe dione* normally has 11-12, seldomly 11-13 lower labials.
- 2: The markings of the head of *Elaphe bimaculata* merge into in two small posterior stripes in the neck region. In *Elaphe dione* these stripes are broader and shorter.
- 3: *Elaphe bimaculata* has 18-20 teeth in the upper jaw, *Elaphe dione* only 15-17.
- 4: The hemipenes of both species are different, but Schulz does not mention in what way they differ.
- 5: The spots on *Elaphe bimaculata* have black borders whereas these spots on *Elaphe dione* are not bordered (open).

I would like to add another difference to this list, namely the form of the eggs. As I have observed myself and read from the descriptions of others, it is shown that the eggs of *Elaphe bimaculata* (Schulz, 1986, Bartz, 1989 and Mattison, 1992) are by comparison with the eggs of *Elaphe dione* long and thin. The eggs of *Elaphe dione* (Langeveld, 1993) are 'shorter' and 'rounder'. The eggs of *Elaphe bimaculata* can be compared with the eggs of *Elaphe situla* and the eggs of *Elaphe dione* with those of *Elaphe guttata guttata*. Steehouder (1992) however mentions the long shaped eggs of his *Elaphe dione* (Chinese form). It is possible that his '*Elaphe dione*' is in reality *Elaphe bimaculata* because his animals come from the province of Jiangsu, where both species occur (Steehouder, pers. com., 1995).

MY ANIMALS

In August 1991 I bought two captive bred snakes from K.D. Schulz. These animals were born in that year and measured 25-30 centimetres. They were of the '*Elaphe situla*-type' (type 3). They had a yellow ground colour with red to red-brown dumb-bell shaped spots. The snakes were individually housed in small plastic containers measuring 20x15x10 cm

(lxdxh). These containers were provided with kitchen paper and a quarter of a cardboard egg box which could be used as shelter. The egg box had the advantage that during sloughing the egg holes can be filled with water which is absorbed and then gradually evaporates; in this way the humidity will be ideal for sloughing. The container was also provided with a small water dish. The containers were placed on a heating cable which was on for 24 hours a day. This is a common way of housing young snakes. From the start the snakes ate pink mice without any problem. Although both snakes ate more or less the same amount of mice the male did not grow as rapidly as the female.

THE TERRARIUM

The snakes grew very fast. After one year they measured 50 centimetres (male) and 70 centimetres (female) and were placed in a terrarium. The terrarium measured 80x40x60 cm (lxdxh) and was made of white melamine covered wood. The floor was covered with three centimetres of wood shavings. A reflector lamp provided heat. During the spring I use a 40 watt bulb, during the summer a 25 watt bulb. The light was on during both spring and summer for 12 hours a day, during autumn for 6-8 hours a day. In situations of high summer temperatures (> 30 degrees Celsius), the lamp was on for a few hours less.

Twenty centimetres from the lamp there was a shelf with a piece of cork on it. On the floor there was another piece of cork and a plastic shelter box which was partly filled with wood shavings. Both cork and shelter box were frequently used to hide. A water dish was only used to drink; even at extreme temperatures (32 degrees Celsius) the snakes would not immerse in the water. An observation also made by Steehouder (1992).

BEHAVIOUR AND HUSBANDRY

Elaphe bimaculata was, in my terrarium, a little shy and hid often in the shelter places. This shy behaviour is relatively strong, particularly immediately after hibernation. If the animals are taken out of their terrarium in this period, they secrete a mucus-like fluid. During checks throughout their hibernation the snakes would threaten with widely opened mouths and even bite when touched. This behaviour however disappears when they were used again to their regular terrarium life. In spite of their shyness they were shown to be rather active animals, which move vividly within the terrarium, especially in the morning and evening.

The snakes eat both dead and living mice from the hand. I fed them once a week with one or two mice. Also pink rats were willingly accepted. The size of the mice depended on the size of the snake. The male got two or three week-old mice, the female was fed on adult mice. Usually I gave living prey which was grasped and constricted. In September I only feed pink mice and rats because in this part of the year the snakes have less requirement for food. Three or four days after their meal the first faeces occurred, which I removed immediately. During sloughing I spray the terrarium every other day; because of this increased humidity the snakes have never had any problems with sloughing. The drinking water is renewed twice or three times each week and the water tank is disinfected by halamid-d (r), a chlorine combination that is often used by farmers to disinfect cattle stables.



Foto 3: *Elaphe bimaculata*. Vorm 2. Morph 2.
Foto: T. Steehouder.



Foto 4: *Elaphe bimaculata*. Uitkomende eieren. Eggs hatching.
Foto: C.M. Langeveld.

HIBERNATION

My snakes hibernate every year for three to five months. From October the light and temperature are reduced, by mid-November the light stays out completely. At the end of November the male and female were separated and placed in polystyrene boxes which were three quarters filled with moist Beech leaves. The boxes were placed in a room with a average temperature of ten degrees Celsius (the maximum temperature measured was 16 degrees, the minimum 7 degrees). During this inactive period all functions of the snake are reduced to a minimum. At the end of February or the beginning of March both snakes were taken out of hibernation. This duration of hibernation was, in this case, successful for the winter of 1993/1994. At the time of writing (March 1995) my snakes have been out of hibernation for two weeks. During the hibernation of 1994/1995 the snakes were kept in a refrigerator for three and a half months at temperatures between 6 and 9 degrees Celsius. After hibernation they were put in a unheated terrarium (15-20 degrees Celsius), which was heated after 24 hours by a reflector lamp. One week after hibernation they ate their first mice.

REPRODUCTION

Elaphe bimaculata is relatively easy to breed. The snakes are sexually mature at the age of 15 months (Schulz, 1986). Mating already occurs in their first year. My snakes mated 11 months after birth. Van Marle (pers. com.), who purchased a couple of my first offspring in 1993, also noticed that his snakes mated within their first year. My snakes mate throughout the year. The most intensive period of mating is during the months of July, August and September. The animals of Bartz (1989) and Steehouder (1992) also mated in this period whilst Schulz (1986) noted that the snakes also mated in October. During mating the male bites the female on its neck and then penetrates with his hemipenis. As soon as the female is fed up with mating she starts to crawl around the terrarium. In doing this, she drags the male with her and because the males hemipenis is still positioned in the female, the male may get injured. Often the shell under the lamp was stained with spots of blood and sperm.

In the month of May or the beginning of June 3 to 8 eggs are laid. Depending on the incubation temperature they will hatch after 25-40 days. Literature shows the following incubation periods:

Schulz (1986):	30 days
Bartz (1989):	25 days
Steehouder (1992):	36 days
Mattison (1992):	30-40 days
Staszko (1993):	25 days.

BREEDING

On March 12th 1994 my snakes were taken out of hibernation and individually placed in a terrarium. From March 26th the male was placed every 5th day for 24 hours with the females. During his time in with the females, I noticed some activity but no matings to occur. Nevertheless, some sperm and blood was found on the shell under the lamp. At the end of April the male was permanently placed in the terrarium with the females. Just before the sloughing of the female, which occurred on May 16th, the wood shavings

in the plastic hiding box were moisted. 13 days after her sloughing the female laid, on May 29th, 7 long eggs. The eggs were removed immediately after laying and put into an incubator. The substrate in the incubator consisted of moist wood shavings; the temperature was 26-28 degrees Celsius; the humidity about 90%. After 39 days, on July 7th 1994, all seven eggs hatched. The neonates sloughed ten days after hatching. Within a week after sloughing all young snakes ate pink mice on their own. The sex ratio was unfavourable: 6 males and only 1 female (6.1). The young snakes resemble the markings of the parents. The spots however are initially darker and become more red as the snakes grow older.

I bred this snake for the first time in 1993. On May 24th, four eggs were laid and these were also kept at an incubation temperature of 26-28 degrees Celsius. Three of the four eggs hatched on July 2nd, after 39 days. The sex ratio was 2.1.

CONCLUSION

The Chinese Leopard Snake is a beautiful (especially type 3) and easy to keep snake, which is also easy to breed and is satisfied with a relatively small terrarium. This all makes *Elaphe bimaculata* an ideal animal for vivariums. I am glad that this snakes gains popularity among vivarium keepers and is bred more and more in captivity. Therefore I hope that in the nearby future it will not be necessary to catch this snake in the wild in order to export it for terrarium purposes.

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