REPEATED BREEDING OF THE LIZARD SNAKE (*MALPOLON MONSPESSULANUS*)

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THE SPECIES

The Lizard Snake is found in South Western Europe, the West Caspian area, South West Asia and North Africa. There are two subspecies: *Malpolon monspessulanus monspessulanus* and *Malpolon monspessulanus insignitus*. We will not enter into the differences between these subspecies now. Those who are interested should read the article by van Woerkom (1982), of have patience until the snake part of the Handbook of Boehme about European amphibians and reptiles is published. For this book, C. de Haan wrote the (presumably extensive) part about the Lizard Snake.

HABITAT AND FOOD

Malpolon monspessulanus monspessulanus is a snake of a wide variety of habitats, for the larger part warm and dry. In Southern Europe the species occurs in the lowlands as well as on the southern and southwestern slopes

of the mountains, up to an altitude of 1800 - 2000 meters. The Lizard Snake is very sharp sighted. It often basks where it has a good view of the surroundings. One will not easily find these animals basking between high grass. Mostly they are lying on or partly between little stone walls or on some elevation, often with their heads raised to have a good view of the surroundings. This makes the species hard to observe in the wild. In most cases the snake will see the intruder first, and it will seek cover. The habitat is thus characterized by the presence of open space. The Lizard Snake even occurs on plains with only some grass vegetation, no higher than 15 cm. The only cover they can seek here, are holes dug by other animals. More often however, their habitat is plains or slopes with scattered bushes. Quite often it is found in the neighbourhood of villages, towns and campsites.
The food of young specimens consists mainly of lizards and small snakes. Larger specimens feed largely on mammals up to small rabbits but will also eat lizards, birds and other snakes.

TOXICITY

Malpolon monspessulanus monspessulanus is an opistoglyph snake: it has a poison gland and enlarged, grooved fangs in the maxillary under the eyes. The poison is quite potent on prey animals. In humans, it may cause temporary and local stiffness and loss of feeling if the snake has been able to chew a finger or hand for some time. Prey animals are chased with great speed and almost always caught in the neck from behind. The snake holds larger prey down

with a few tight windings and chews the poison into the wounds. The victim dies quickly, within a minute. In this way, vipers are also caught and being caught on the neck just behind the head, they are not able to strike.

UNDERVALUATION

Until now the Lizard Snake has not been very popular with snake keepers, although it really should be. Admitted, most people do not consider it a beautiful snake, but as for its behaviour it is definitely a much more interesting snake to keep than most others. And what can be called beautiful? The 'severe', almost angry expression of the head, the large eyes that seem to see everything, the characteristic posture with the front part of the body lifted high, the magnificent way of moving: all are elements of an authentic beauty.
It is not a difficult snake to keep and provided the cage offers the right circumstances, this snake does exceptionally well in captivity. As for its demands: sand on the floor, ample coverage in the back of the cage, a hot spot under a lamp or on a heating tape or cable, this is all that is needed to keep Lizard Snakes well. As for the rest, they are extremely hardy and almost never ill. The only thing they seem to be very susceptible to, is mites: if you happen to have mites on your snakes, it will probably show first on the Lizard Snakes.

RUBBING

An interesting behavioral aspect of this

snake is the 'rubbing behaviour': especially when it is hot and dry. Normally after shedding and often also after feeding, the animal rubs with the point of the snout according to a fixed pattern alongside its belly and sides, applying a colourless, fast drying glandular liquid, secreted from the nose. The movement consists of a series of repeated up and down rubbing of one side. When the whole side has been done, the other side is worked. What all this really means, is subject to much discussion, although as far as we can see, the most plausible explanation is that the snake in this way applies a scent which has some (still undetermined) effect on conspecific animals.

HEAVY HISS

This snake is famous for its loud hissing when cornered. When you get near the cage, you can hear a very loud hissing, even from animals that are in captivity for many years or even have born in captivity. We don't have the impression these animals really get tame, especially not if you don't overfeed them. The only thing that can be achieved, is that they stop striking immediately. No harm done: hissing and slipping away smoothly remain.

REARING PROBLEMS

When rearing young, it appears to be a problem that they seldom start to feed on pinkies on their own. Young snakes and lizards are accepted very well, but if you want to skip this (natural) food items and have them eat pinkies, you have to force-feed them for a time (though not always:

Hans van der Rijst had many young that started feeding on young mice immediately). Normally, they start accepting dead and live pinkies after some weeks (or months), and from that moment on growth can be very fast.
At any rate, it should be clear that one should never try to keep young Lizard Snakes together with young specimens of other snake species, if one would like to keep some of them too.

THE BREEDING STOCK OF T. STEEHOUDER

At the time of the breeding in question, there were two males and two females in the cage, which are kept together all the year round. The oldest male (Male 1) has been in his posession since 1982, the younger male since 1984. Both are from Spain. The estimated age of male 1 is (in 1989) about 9 years, of male 2 about 7 years. The weight of male 1 in 1988 was about 690 grams.
Male 1 had been severly damaged some years ago. While shedding he suddenly developed large subcutaneous blisters filled with glandular liquid. After shedding these spots dried up stiff, so that the skin was not able to stretch properly. While swallowing a prey, the snake tore its skin over a length of about ten centimeters, revealing the raw flesh underneath. The only treatment has been that these spots and the raw skin were disinfected and that the animal was given a calcium-vitamin injection. In the course of the following year the torn skin healed rather fast, and there is even the beginning of the forming of new scutes. The animal is not as handsome as it was before, but it is healthy and strong and proved to be quite fertile. The cause of

the blisters is still undiscovered: possibly subcutaneous irritation by mites; a hormonal distortion; a deficiency?
The oldest female (female 1) was purchased in 1983, originating from Spain too. Her age can be estimated as about 7 years (1989). Her weight at the time of the 1988 breeding was about 340 grams. The younger female was bought in 1985 from a private herpetologist who had caught her in the South of France. She is an extremely beautiful animal that shortly after her arrival deposited a clutch of eggs from which hatched extraordinary beautiful young. In 1989, unfortunately, this female was accidentally swallowed by male 1, so there will never be anymore young so handsome.

BREEDING IN 1987

In 1987 the animals were hibernated from January 1st until January 25th at temperatures varying from 8 to 14°C, depending on the outside temperatures. During the period after the light was on for some hours each day, the rest of the day being cold (about 12°C).
Male 1 started feeding on February 3rd, female 1 on February 11th. Their food intake was larger than that of the other couple in the cage. Dominant behaviour of male 1 with regard to the other couple made it necessary to split the couples into different cages. Copulations were not observed, in contrast to actual mating behaviour, which consists of a relentless wriggling and shoving up and down of the male's tail over the female's. Sometimes one happened to be lucky to see the long, slender, wormlike hemipenis 'feeling' over the female, searchin for her cloaca.

The female shed her skin for the first time that year on May 5th, and layed nine eggs during the night of June 14th to 15th. The sizes were:

egg	sizes	
1	50 x 24mm	
2	48 x 24mm	
3	55 x 25mm	
4	46 x 24mm	(weight 21 grams)
5	47 x 23mm	
6	43 x 25mm	
7	40 x 24mm	
8	45 x 24mm	

On June 23rd five eggs proved to be spoiled, of which three had been fertile. On July 30th four young hatched, weighing 10, 11, 11 and 12 grams, three males and a female. Females can be recognized as they have more conspicious markings on the head especially on the underside and on the upper labials. The hatchlings were of the following approximate sizes and weights

sex	length	weight
male	38 cm	12 g
female	35 cm	11 g
male	35 cm	11 g
male	35 cm	10 g

One of the hatchlings (a male) started eat freely after some weeks: rather large nestlingmice, offered live as well as dead. A second, the female, started to feed after a couple of force-feedings: dead, cut pinkies. The other two had to be forcefed with rat tails for a longer time. On October 25th one of the young males (that which fed well on its own) appeared to have swallowed one

of the other males: a pure form of cannibalism. This was the first time the owner was confronted with this kind of behaviour from *Malpolon*. It must be stated that it was also the first time he kept young Lizard Snakes together in a small cage (40x20x20 cm) at constantly high temperatures. After this regrettable incident the remaining three hatchlings were given a larger cage (50x40x 30 cm, lxhxw) with more cool spots.

BREEDING IN 1988

During the winter of 1987-1988 the animals hibernated again, now for eight weeks at temperatures ranging from 6 to 12°C, in their own cage, all animals together. On May 4th mating behaviour was observed, again from male 1 and female 1. About 13.30h there was a copulation which lasted for about ten minutes. During the copulation the animals were lying still together, no wriggling and shoving.
Female 2 and male 2 again did not show any mating behaviour. the owner (T.S.) is fully convicted that in this case there is a truely dominant male (male 1) that has a monopoly on procreation. On April 30th it was observed that male 1 chased male 2 fiercely away from the basking spot, biting him in the sides. After some five minutes, male 2 returned and was tolerated.
Seven eggs were laid during the night of 28-29 June, starting at about 22.00h. They were hatched (just like the year before) in coarse sand at a temperature of 28-29°C. After 46 days, on August 13th, five young hatched;
Eggs 4 and 5 felt different, seeming to be a little softer, as it were a little 'liquid'. Egg 4 seemed to be not fertilized

when light shined through it (no veins, no darker spot). On July 1st however, it proved to have been fertilized. Egg 5 also seemed to be unfertile at first. When lighted on July 1st there was fertilization,

egg	size	weight 29/6	weight 1/7	weight 8/7	weight hatchling
1	53x25mm	20,5g	21,5g	21,5g	14g
2	53x25	22	22	22	13,5
3	50x25	20	20	21	spoiled
4	50x25	20	20	20,5	13
5	46x25	18	18	-	spoiled
6	51x25	20	20	20	13,5
7	49x26	21	21	21	13,5

but at the bottom of the egg and not on the top. The egg was placed back in exactly the same way. It spoiled and was eliminated. Possibly there is a connection between the spoiling and the fact that the fertilization spot was at the bottom of the egg. Maybe it is the fertilization starts normally at the top of the egg, and some eggs are deposited in a wrong position. Egg 3 had a kind of pimple on the underside and smelt bad. There were veins to be seen, so it was left in place for some time, until it spoiled.

THE BREEDING STOCK OF H. VAN DER RIJST

This breeding concerned 2 males and 1 female. Male 1 (155 cm; 700 grams) has been in the posession of the owner since 1987,

male 2 (125 cm; 400 grams) since 1988. All three are wild caught from Spain. Outside the mating season the sexes are housed separately, the males in a cage of 150x50x 40 cm, the female in a cage of 75x50x40 (lxhxw). The animals were hibernated from December 7th 1987 to January 28th 1988 at temperatures varying from 14 to 21°C. When the weather in Southern Europe was warm that winter, these animals were also given light and warmth for some days. The males made use of these 'sunny' days during hibernation, the females did so to a lesser degree.
After the first shedding the female was put with the males, and both were interested. The largest and apparently strongest however chased away male 2 as far from the female as possible. The female was mostly basking within male 1's curls, while male 2 was lying at the other side of the cage. After a week male 2 was taken out. No copulations were observed, but the snakes were lying motionless together with their heads lifted high. These were probably the moments they copulated.
The female accepted a mouse for the last time on April 15th. At the end of April the eggs could be seen. She shed on May 5th for the second time that year. On May 13th she was lying behind a log with her head lifted high, watching the surroundings. She must have been laying her eggs then. In order not to disturb her, the cage was not searched before the following day, when 5 eggs were found. All were fertile, with red veins. They had an average weight of 16,5 g with a lowest weight of 13.7 g and a highest of 19.3 g. The average size was 54.5x 23.8 mm. The eggs were hatched at a temperature of 27-30°C. One egg spoiled rather soon, the other four hatching after 58-67

Foto 1: *Malpolon monspes. monspessulanus*,
male. foto T. Steehouder.

Foto 2: *Malpolon monspes. monspessulanus*,
juv. foto T. Steehouder.

days. There were two males and two females, with an average weight of 10.75 g and an average length of 30 cm. One male had an eye which was much too small, while the other male couldn't hold its rectum. Only after some weeks did the animals start to feed on fuzzies. Figure 1 shows how fast a well feeding male can grow.

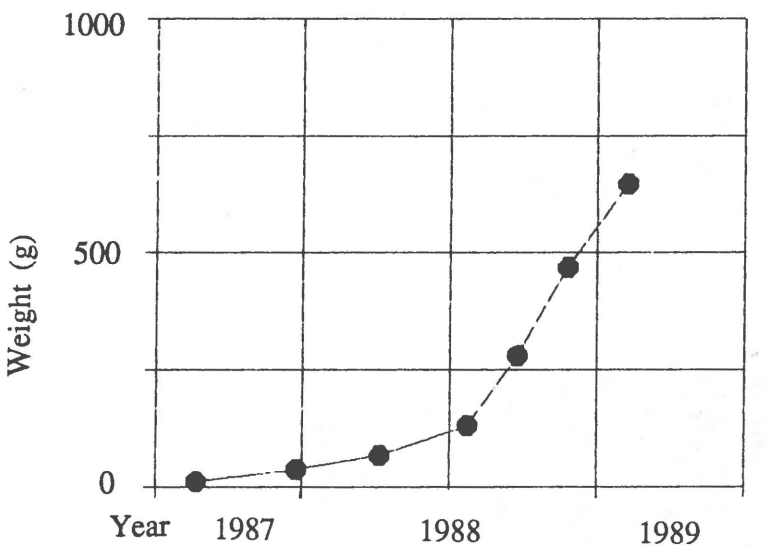

Fig 1. Growing curve of snake #4

PERSPECTIVES

We expect another breeding from the same animals in the coming years. They have been breeding in 1989, and will probably con-

tinue to do so. It seems we have a stable breeding of the Lizard Snake. The number of devotees to these snakes is growing slowly but steadily, and of course they are right.

LITTERATURE

Woerkom, A.B. van, 1982. De slangen van het genus *Malpolon*.
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