

# HEALTH & DISEASES



*This column is taken care of by the "Studygroup for Diseases and the Optimum Keeping and Breeding of Terrarium Animals" of the Belgian Society "Terra". If there is a question concerning health or diseases, feel free to contact the president of the Studygroup: Mr. Hugo Claessen, Arthur Sterckstraat 18, B-2600 Berchem, Belgium. He will try to answer your question in this column to the benefit of all members.*

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## TREATMENT AND AFTER-CARE OF YOUNG SPECIMENS OF ELAPHE SUBOCULARIS AND ELAPHE HELENA SUFFERING FROM GASTRO-ENTERITIS.

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### INTRODUCTION

One of the ways in which I gain pleasure from my hobby, keeping snakes, is to buy newborn snakes, raise them and try to breed from them. It is very pleasant to be able to follow the whole course of their lives, to get to know everything about them, and, when you succeed in breeding them, to have the satisfaction of knowing that you have kept

your animals all those years in the right way. Because they are captive bred and raised, your animals are almost always healthy, which cannot be said of wild-caught specimens.

Once, though, things went wrong. I had ordered a pair of newly hatched *Elaphe subocularis* from an American breeder. He sent all ordered snakes to an acquaintance in England, who brought the animals to Holland in October 1984. Three pairs were sent to England: two for English keepers, the third for me.

On 17 October 1984 I received the animals. They were yellow with the well-known brown-black H-shaped markings on the neck and and the back. The male (almost 30 cm long) was somewhat larger than the female (about 25 cm long). On 8 November their weights were 18 and 12 g respectively.

The evening I received them, they each ate two baby mice of 4.5 and 5 g, which was a most encouraging sign.

#### REGURGITATION OF THE PREY

On 19 October, two days after their first meal, they regurgitated the mice. I assumed the quantity had been too large in relation to the body volume of the snakes, and thus did not worry.

On 26 October I fed them again, each with one 5 g mouse. After two days things went wrong again. On 3 November I fed them a still smaller mouse, of 4 g. I was very disappointed when these too were thrown up.

The only thing from which such young snakes could suffer, I guessed, was a flagellate infection. In such cases, snakes often throw up. I had not been able to examine faeces microscopically, as they had not yet defaecated. As I had always heard that a Duodegran treatment against flagellates can do no harm, I decided to treat them.

Duodegran contains 10% Ronidazole (as effective component), of which the animals should get 10 mg/kg bodyweight. The dosage of Duodegran consequently is 100 mg/kg bodyweight. I had the pharmacist weigh out 50 mg Duodegran, for a four day treatment. Every day I dissolved 50 mg in 5 ml water in a small container. Firmly shaken, the powder dissolved almost completely, so that the liquid could be sucked into a syringe.

From the described liquid (50 mg Duodegran in 5 ml water) a snake of 18 g bodyweight should be administered 0,18 ml orally. This seems difficult to measure, but with a small 1 cc syringe - available through a vet or a pharmacist - it is easy, because on the syringe the graduation is accurate to 0,01 ml.

If one is dealing with a snake of considerable size, the syringe can be carefully pushed into the snake's throat and emptied. For smaller snakes a thin tube must be applied to the syringe.

Personally I do not use a tube, but a thick stainless steel injection needle of 2 mm diameter, cut off at 6 cm length. Around the point of the needle a ring of stainless steel solder is applied, which has been smoothly polished, so that the throat and gullet of the snake are not damaged when it is introduced. This device is shown in figure 1.

2 mm syringe needles are hard to obtain, but maybe a friendly veterinarian will order one for you, as they are for instance used to take blood from horses.

On 8, 9, 10 and 11 November I treated both *Elaphe subocularis* in the described manner with Duodegran. At the same time I treated an *Elaphe subocularis* (a 'blonde' variety) that I already had had in my possession, as I had housed the newcomers initially in the same cage as this one. On 11 October this animal had eaten two mice of 8 and 9 g, and on 26 October a 5.5 g mouse. These were digested normally, so there appeared to be no

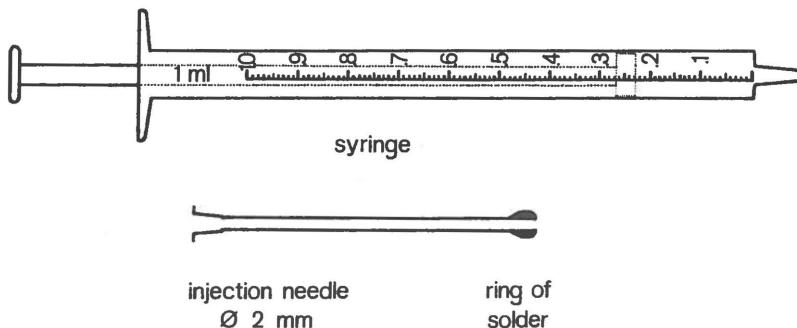


Fig. 1. Syringe with metal canula, for the administering of small quantities of liquid to small snakes.

reason to worry.

After the treatment with Duodegran I fed the blonde *Elaphe subocularis* a little mouse of 4 g, and the two new snakes each a 2 g mouse. When after a week this prey appeared to be digested well, I was relieved: the disease was cured, it must have been a flagellate infection.

#### EXTENSION OF THE DISEASE

Unfortunately I had been jubilant too soon, for the blonde *Elaphe subocularis* refused all further prey, the female of the new snakes ate on 26 November a 2.5 g pinky but threw it up four days later, and the male ate a 4 g pinky on 26 November, digested it, but threw up all further food items during the month of December.

A call to England revealed that the four *Elaphe subocularis* there were all regurgitating too. Furthermore it suddenly occurred to me, that six young *Elaphe helena* (weighing 12-20 g), whose cages adjoined that of the *Elaphe subocularis*, had thrown up their food items regularly since 26 October, or did not eat at all. Also, some of them

had sloughed badly, the skin not having come off well and was torn in pieces, whereas they had always sloughed well previously. The six *Elaphe helena* had been infected and been ill since nine days after the arrival of the *Elaphe subocularis*! I was shocked and afraid of losing my whole snake collection.

I presented the case to Dr. G. Dorrestein, an assistant of Prof. Dr. P. Zwart of the Section Pathology of Exotic Animals of the State University of Utrecht. He concluded that there had to be a case of gastritis (infection of the stomach) and as the Duodegran cure had had no effect, there was probably a bacterial infection.

The medicine I received, was Neo-Diarsuspension, containing as effective component 6.65 mg neomycin per ml. Of this suspension I had to give each snake one drop orally twice per day. It was the middle of December when I started the treatment, but after two days I stopped because two *Elaphe subocularis* had fed and I would not take the risk of their regurgitating again because of the stress of the treatment. After a couple of days they threw up anyway, whereafter on 26 December I renewed the cure which lasted for six days.

Meanwhile I learned that three of the four English *Elaphe subocularis* had died. Alas, on 30 December one of my *Elaphe helena* died, and on 31 December a second one. On 2 January 1985 I gave them to Prof. Zwart for autopsy. Two days later I learned the result: both animals had had an infected stomach and small intestine; one animal had in addition some little inflammations in the liver and the kidneys. Cause of death: gastritis.

Prof. Zwart advised me to treat the other ill animals with Belco-spira, which contains 200.000 I.U. colistine per ml. As the dosage is 50.000 I.U./kg (= 0.25 ml/kg) bodyweight, the solution was diluted 20 times with sterile physiological salt solution, which brought the dosage at 5 ml/kg

or 0.05 ml/10 g bodyweight.

Colistine has the advantage of also being effective against *Aeromonas* and *Pseudomonas* bacteria, to which weakened snakes are very susceptible.

The cure lasted for 14 days: the first three days a daily dose, then for the next ten days a dose every other day. These took place on 5, 6, 7, 9, 11, 13, 15, 17, and 19 January. I administered the medicine through the metal canula as I had done with the Duodegran solution.

Furthermore, on 13 January I started to forcefeed whipped egg in which I had mixed some Carnicon (a calcium and vitamin preparation), in order to allow the stomach to renew its activities slowly with this easily digestible food. I gave the smaller snakes (all *Elaphe helena* and the two new *Elaphe subocularis*) 0.5 ml of the mixture, and the larger, blonde *Elaphe subocularis* 1 ml, using the canula.

All this could not help some animals, though, for on 14 January the third *Elaphe helena* died, and on 15 January the fourth one. Thus three *Elaphe subocularis* and two *Elaphe helena* remained.

On 17 January I gave the remaining snakes 0.5 and 1 ml respectively of egg-mixture again, and on 22 January they were each given a newly born pinky of only 1.3 g.

In one *Elaphe helena* the pinky could still be felt as a hard lump in the belly after two days: it had not been digested. That evening it lay dead in its cage, being the fifth dead *Elaphe helena*.

The pinky in the sixth *Elaphe helena* digested well, and so did those of the three *Elaphe subocularis*. On 27 and 30 January each snake got another mouse of 1.5 g, which were also digested successfully.

On 4 February totally unexpected, the female of the 'new' *Elaphe subocularis* died, just when the animals seemed to be doing so well. The male threw up twice a (too large?) prey in February, so I start-

ed to feed 1.5 g mice again. I enlarged the weight of prey very gradually: at the end of March 2.5 g, and by the end of April 7.5 g. The two *Elaphe subocularis* and the only *Elaphe helena* left, kept eating well, fortunately, and began to increase in weight. The weight curves of the nine snakes under discussion are shown in figures 2 and 3.

## CONCLUSIONS

Quarantine.

The first conclusion to be drawn, is of course that one should never trust a snake coming from someone else. It is quite clear from this case how important it is to keep any snake in quarantine

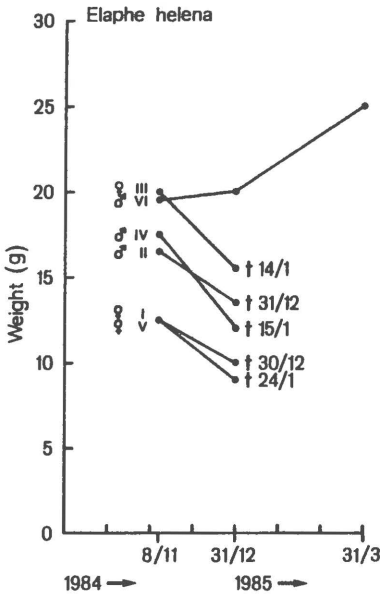


Fig. 2. Weight curves of six diseased *Elaphe helena*.

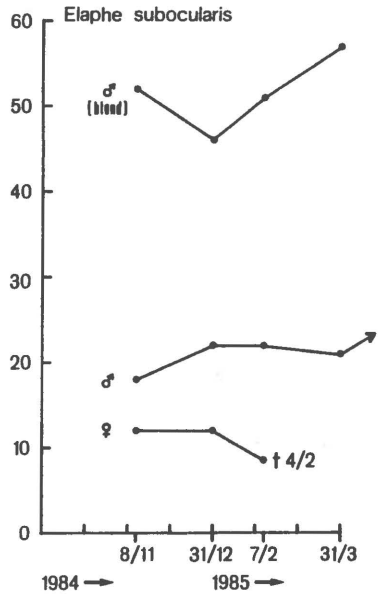


Fig. 3. Weight curves of three diseased *Elaphe subocularis*.

for three months, which means:

1. Every animal in a separate cage that is easy to clean: newspapers or tissues on the floor, a small water container, a little branch for climbing, and a small turned over flower pot under which the snake just fits as a hiding place;
2. For each cage separate cleaning materials (e.g. brush);
3. Clean your hands thoroughly after touching something in the cage before you go into the other cages;
4. Careful observation of the animal (behaviour, food acceptance, etc.);
5. Examination of the faeces for flagellates, worms, etc., and treatment of the possible infections (see Claessen, 1982, 1983, 1984a, 1984b; Van Riel & Claessen, 1983);
6. A prey animal which has been in a quarantine cage and has not been consumed, should never be placed back in the stock cage or with another snake, but should be disposed of.

#### Examination of faeces.

The second conclusion is that I had assumed too hastily that the snakes were suffering from a flagellate infection. I should have waited for defaecation or have tried to get some faeces by carefully massaging the belly in the direction of the cloaca. Then a microscopic examination would have pointed out that this was not a flagellate infection, and a treatment with antibiotics could have started earlier.

#### Autopsy.

The third conclusion is that the autopsy on both deceased snakes has saved the lives of some other snakes. It led to a proper diagnosis and to the



administration of the most effective medicine. The fact that three other *Elaphe helena* still died, was due to the fact that they were already too weak. The death of the female *Elaphe subocularis* has in my opinion another cause, of which more will be said.

It is important that each dead snake is dissected, firstly for the benefit of veterinary science (so that we get to know more about snake diseases), secondly, enabling you to take adequate measures when other snakes in your collection exhibit the same symptoms.

Feeding after a gastro-enteritis infection.

The fourth conclusion is that snakes, after enteritis (bacterial or as a result of flagellates), should be fed only very small prey in order to prevent further regurgitation. The stomach must resume its full function, and is only able to digest small quantities of lightly digestible food. I acted accordingly by feeding egg (containing sufficient important nutritious substances) at first, into which extra calcium or vitamins can easily be mixed. Subsequently I fed newborn mice of 1.3 g only, and further on 'pinkies' of slowly increasing size: 2.5 g at the end of March, 7.5 g at the end of April.

Chance of survival.

The fifth conclusion is that the smallest snakes incur the greatest risks in case of a serious disease (see figures 2 and 3). After the infection by the imported *Elaphe subocularis*, five of the small *Elaphe helena* did not survive, though they were well fed, whereas the much larger blonde *Elaphe subocularis* suffered relatively the least, just refusing food for a period, but never regurgitating.

Weight control.

The sixth conclusion is the most painful for myself: I still think the female *Elaphe subocularis* would not have died if I had controlled her weight better. After the Colistine treatment, she did very well: On 22, 27, and 30 January she ate pinkies of respectively 1.3, 1.5, and 1.5 g, which were digested well. Moreover, on 31 December, it appeared that she had not lost weight; the five dead *Elaphe helena* all lost weight (see figures 2 and 3). If I had weighed her more regularly, I would have noticed that her weight had diminished so impressively since then: 29% in five weeks! I could have increased the feeding frequency, for instance. But possibly she was already too weak to survive.

I advise you to weigh your snakes regularly, for instance after each sloughing or at the end of each quarter of a year. Write down the precise feeding dates. I myself make a note of the weight of the prey animals (I have a letter-balance in my snake room to weigh each mouse before feeding). Snakes that are ill or quarantined, must be weighed more frequently, for instance every week. Keep an account of the weighing data in separate indexes, so that loss of weight gets noticed immediately.

#### POSTSCRIPT

In an evaluative discourse with Prof. Zwart, it became clear that the Belco-spira would better have been administered by injection (intra-abdominal, in a dose of 50.000 I.U./kg bodyweight), as indications existed of infections in the liver and the kidneys. Colistine is not resorbed by the intestinal wall, and its effects are thus restricted to the intestinal tract when administered orally.

The concentration of the trade liquid has been changed in 1985: it now contains 1.000.000 I.U./ml.

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