
HIBERNATION: A PROBLEM?

by Hans van der Rijst, Wolweverslaan 38,
3454 GL De Meern & Ton Steehouder, Theresi-
aplein 24, 5041 BJ Tilburg, The Nether-
lands.

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INTRODUCTION

Many beginning reptile keepers have a pro-
blem during the year. Winter is coming. The
animals apparently are losing their appeti-
te and often get restless. They are suppo-
sed to start hibernating, but that is just
what the problem is: do they have to? and
how is it to be done? and for how long? at
what temperature?

This article tries to give some answers to
some questions people ask during this pe-
riod.

For snakes and lizards from temperate cli-
matic zones a rest period during the winter
months is indispensable to keep them in
good health. Of course, they will not die
when kept warm during the winter, but in
the long run they will certainly do less
well in comparison with animals that are
allowed to hibernate.

They don't have to, but they should hiber-
nate. If you want them to breed, they have
to, anyway.

HOW TO DO IT?

In the first part of this article we will discuss how snakes hibernate under natural circumstances. In the second part we will see how we can imitate such circumstances indoors. The article is about snakes, but most of the facts are true for lizards too.

NATURAL HIBERNATION

Only snakes from temperate climatic zones hibernate. In these zones the average temperature lowers considerably in winter, by day as well as by night. Because of these low temperatures the animals are no longer able to digest food. Digestion only takes place within a temperature range with limits depending on the species involved. Somewhere within this range there is a more or less optimum temperature for digestion. If it is no longer possible to reach this optimum during a reasonable period each day, the animals will stop feeding. If the temperature drops further, life functions will diminish, and so will the animal's expending of energy. Consequently, food intake is no longer necessary.

On the other hand, there also is a diminished capacity to move, to flee or to defend itself against predators, especially when temperatures get really low. Consequently it is important to find a safe place to hide from natural enemies. Another important point is that snakes need to avoid temperatures below zero. Frost would after some time mean a sure death for them.

DEMANDS FOR THE HIBERNACULUM

A good hibernaculum should offer a safe hiding place and protection against frost. A third demand is, that the snake is able to find a basking place in spring, in the immediate neighbourhood of the hibernaculum. This is necessary for the snake to be able to 'test' the intensity of the sun on a sunny day in spring. We have to take that quite literally. People still tend to consider the hibernating of reptiles as a rather passive activity, but this is far from true. In reality, the animal is responding continually to outside temperature changes.

The depth at which, for instance the adder (*Vipera berus*) in the Netherlands is hibernating, may vary from 15 to 70 cm over the whole winter period. During very cold periods it hides deeper in the cavity, during warmer periods it comes back to the surface. At first sight, this may seem a roundabout way to do, as it would seem to be easier to immediately crawl deep into the earth, thus avoiding frost whenever it should come. The drawback of this method however would be that at this depth, it would be very hard to 'keep in touch' with surface temperatures. As a result, the animal would be in danger of not noticing the arrival of the spring in time. It is therefore better to keep in touch with the surface world by adjusting the depth at which to hibernate.

MOISTURE AND FAT RESERVE

The relative air moisture in a hibernaculum in general fluctuates between 80% and 100%. As a result, there is very little loss of

water for the snake. As far as we know, snakes under natural circumstances do not take in any water during hibernation. Many species, for example the European *Elaphe* and *Vipera*, hardly lose any weight at all during this period. It is known from the common adder (*Vipera berus*) that females may enter hibernation directly after having given birth. They are still very skinny and almost without fat reserves. Yet they emerge in spring without an increased mortality rate. Other species, like the Montpellier Snake (*Malpolon monspessulanus*) do lose a considerable amount of body weight, as my (Hans') measurements on specimens of this species under indoor circumstances point out.

It may however be better for females of all species not to enter hibernation with an apparent lack of fat reserve. Weakened females are in danger of not being in an optimal condition for reproduction in time, which could result in their having less eggs than otherwise would have been possible.

In general, most herpetologists have the opinion that females should not be too heavy, as this is supposed to have a negative influence on their reproductive ability.

WINTER SLEEP OR WINTER REST?

The expressions 'winter sleep' and 'winter rest' are usually considered as interchangeable, both covered by the expression 'hibernation'. Strictly speaking, this is not true, as there is a great difference between them.

As far as you can speak of 'winter rest' in reptiles, this involves a period during

which the temperature does not fall extremely. Food intake then stops, but the animals remain active to a degree. On sunny, not too cold days, they lie basking outside the hibernaculum, with colder periods passed in the hiding places.

You only speak of a winter sleep if the animals withdraw into their hiding places during longer periods of cold, and indeed are almost completely passive during this time.

It depends largely on the climate in the distribution area of the reptiles, whether they hibernate in the form of a winter rest or a winter sleep. Species that live in mountain areas or in Mid- or Northern Europe or America, in general go through a winter sleep. For animals from Southern Europe, for instance, it is not that simple. There are species that rest, like *Malpolon monspessulanus*, but also species that sleep (sometimes very long), like the Ladder Snake (*Elaphe scalaris*).

HOW ABOUT INDOORS?

From the above some things should have become clear by now. But how to do it in the vivarium?

PREPARATIONS

The first thing to do is to stop feeding. You should not decrease the temperature yet, so that any food still present in the animals digestive track can be digested properly.

Of course the snakes are free of parasites. Have their faeces examined and treat the

animals if necessary for worms or unicellular parasites.

After some weeks you start to decrease the duration of lighting and heating. This can be done quite abruptly.

Again some weeks later the moment has arrived that the animals start hibernating.

IN THEIR OWN CAGE

The easiest thing to do is allow the animals to hibernate in their own cage, in their own trusted environment. Of course, this can only be done if the temperature in this cage can get low enough. In some cases this can be done by simply taking the whole cage to a cool place in the house, like the attics or the cellar.

A first possibility is, to give the snakes a winter rest at temperatures at least as low as 17°C. At that temperature there is hardly any energy loss, while life functions still remain intact, thus the snake can remain active and resistant to diseases, and even food rests can digest to some degree. It is best to darken the cage as much as possible, for instance, covering the glass panes.

If the temperature in their own cage is able to fall really low (for instance between 3 and 10°C), the animals can have a real winter sleep in their own environment. In all cases it would be best to create a spot in the cage where the snakes are able to curl up tight with overall contact with covering material. Through this they will feel safe and comfortable. You could for instance put a sleeping box in a corner of the cage, or drop a pile of branches and leaves in the cage.

The water tray can be left in the cage, renewing the water regularly. It will most likely not be necessary to spray any water in the cage to increase the air moisture, but you could do it at intervals if the cage is in a room with central heating (but how likely is it that you will heat the room when the animals are in winter rest?). In this way one of the authors (TS) has succeeded in wintering with breeding success the following animals: *Malpolon monspessulanus*, *Elaphe taeniura friesei*, *Elaphe guttata emoryi*, *Vipera aspis*, *Vipera ammodytes*.

Since the temperatures in most terraria of his snake room don't exceed about 14°C in winter without extra heating, that works. This all means, that hibernation temperatures are by no means constant with him, on the contrary. Apparently that is not a problem either and similar to natural conditions, as will have appeared from the first part of this article.

OUTSIDE THEIR CAGE

Naturally it is possible to simply take the animals out of their cage and put them in a case or box, preferably just small enough to contain the animal with or without its cage-mates. You should put some material like dead leaves in the box. Many snake keepers avoid the use of peat as it is said that snakes get their mouth full of peat and suffocate. Other people use peat without any bad effects.

You can also use coarse sawdust or wood shavings. Sawdust has a tendency to get mouldy, however, when it is moist. You should always take care that the air moisture remains high and yet the material in

which the snakes hide does not get wet. As long as there is condensation on e.g. the cover of the cage, there is no need for a water tray. For fresh air, some little holes in the cover will suffice. You can put the box in a cold place, as a ceiling, a cellar or, of course, a refrigerator. It is not necessary at all to create temperatures lower than about 5°C. About 10°C will do fine for a real hibernation. You should pay attention to the fact that snakes can respond even at temperatures of 4 or 5 degrees at disturbances. Particular keepers of poisonous snakes should know that. It won't be the first time a keeper of poisonous snakes has been bitten because he thought his snakes were not able to do so.

SPRING COMES

In principle you are the one who decides when spring will arrive. It is however sensible to synchronize this arrival with that of real spring, in order to prevent any unfavourable influence from outside climatic circumstances (e.g. too little light by day, or too much cold at night). If the animals hibernate in their own cage, all you got to do in spring is start exposing the snakes to light and heat again, first during part of the day, later on all day long.

If they were put away in a refrigerator or in a cold room, it is best to ensure a gradual change-over. For instance, you could put the box in a corridor for a few days, then for a few days at room temperature in the cage. Thereafter you open the entrance of the box, and switch on the light for some time each day, allowing the

animals to decide for themselves whether and when they want to come out and start basking.

As soon as the animals come out, offer them fresh water. Food can be offered within a couple of days after the light is switched on again. Some species won't eat before the end of the mating season, others start feeding immediately after hibernation. In general, females start feeding sooner than males.

CONCLUSION

As you see, it's all quite simple. Just do it!