

## Herpes virus in *Testudo horsfieldii* (Four-toed Tortoise)

By Sjef Ramaekers

The Four-toed Tortoise (*Testudo horsfieldii*) is a land tortoise which is often kept and traded in large numbers. Unfortunately, it has the image that it is easily kept in captivity, but the facts are different. Within the studbook, we keep records of the mortality rate among the animals for years, death often occurs just after hibernation. Apparently healthy animals die overnight. For a successful hibernation, several factors are important like general condition and the environment in which hibernation takes place. But are there other reasons imaginable as to why this tortoise species does not survive in spring.

*Testudo horsfieldii* is considered a carrier of the herpes-virus. A virus which occurs in several tortoise species and which has the characteristics that it strikes when the condition and immune system of the host are not ideal. Herpes has different strains, *Testudo horsfieldii* is usually the carrier of strain number 1432.

Through horizontal transmission (saliva, blood, faeces) the virus is spread and implants itself in the host. Herpes is seen as a highly communicable and deadly virus. That being said, there is much not yet known about the virus, like: how about the offspring of infected parents? How reliable are the test results? Can antibodies against the virus always be proved? Is a direct infection via earth or other objects in the terrarium possible? Could it be that the presence of the virus, whether combined with a bad condition and/or bad hibernation circumstances, will have fatal consequences for the *Testudo horsfieldii* which just awoke from its hibernation?

To gather more insight in the issue with herpes, a small survey was conducted in 2013, but many had doubts or reasons not to participate.

- You make it very difficult for yourself, when you know your animals have herpes,
- Studbook participants were asked if they were prepared to participate in the survey. A small number agreed to take part. If it appeared that the animals have herpes, there is no proof that the deaths after hibernation were caused by the virus.
- I don't want to transport the animals for the survey.

In total, animals from 6 locations were tested, Jo Stumpel, veterinarian did the blood tests and the subsequent processing of the blood samples. The results were that on 4 of the 6 locations the animals were positive on herpes. Thus, only 2 locations were negative for herpes.

The following background information was given for the 6 locations:

- On 1 location it was a solitary animal (appeared negative),
- On 5 locations, there were composite groups and the animals have been in contact with other tortoises (species). On this 5 locations, 4 locations tested positive for herpes.
- 3 of the 6 locations, the past 2 years before the survey, showed an unexpected loss/death after hibernation. These 3 locations have now tested positive on herpes.

Prior to this survey 2 other locations were tested and they also tested positive now.

For the total image this means that in total 8 locations were tested from 18 locations/studbook participants (situation 2013). From the 8 tested locations, 6 (75%) tested positive!! From these results, it is probable that a large number of the other locations will also test positive.

What does the result mean?

- When you know that your animals tested positive, what then? The animals will not die immediately, but there is a heightened risk. Insufficient animal management will certainly induce herpes.
- To expect that your own animals have no herpes seems unrealistic, considering the results of the survey. This also means that exchanging animals within or outside the studbook, has to be done with the knowledge that infection with herpes is a real risk.
- The studbook aims to have a (genetically) healthy population of tortoises in captivity.

Is that the case? Will we be able to realize the goals of the studbook with so many animals that are tested positive for herpes? Do you want to accept as studbook, that so many animals are tested positive for herpes? Is it desirable and possible to keep animals tested negative and positive within 1 studbook? What does it take?

- The high prevalence begs questions. How did it start? Only by exchanging animals here? What is the status of animals in the wild: how many animals are tested positive for herpes? And what with the animals in the trade coming from farms, how many of these animals are tested positive for herpes?

All these questions deserve attention and provide enough challenges for the future.

This was my last contribution to the studbook as studbook holder. After 10 years, Carlos Voogdt of Utrecht University will take my role as (co) studbook holder. Carlos works as a researcher at the veterinarian faculty and has years of experience in keeping *Testudo horsfieldii*.

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