



Snake mites represent a serious problem for snake-keepers if they gain access to a collection. These parasites can be hard to spot initially, multiply rapidly and can ultimately be very debilitating to snakes exposed to them – quite apart from being hard to treat, especially since not all snakes respond well to conventional treatments. The introduction of a new biological method of control here in the UK will therefore be welcomed by many fanciers. Damien Morel, Romain Royer and Chris Applin reveal more about what is involved.

# A new green approach to eliminating snake mites

“There’s none so small but you his aid may need.” In penning this moral in his story *The Lion and the Rat*, the French fable-teller Jean de la Fontaine, writing in the 1600s, would never have thought it could apply to snakes, and yet now, microscopic arthropods are helping reptiles to get rid of external parasites. These micro-predators are present in the natural environments of snakes, thereby restricting the reptiles’ exposure to these parasites in the wild, but they have never been found in vivariums ... until now. This discovery paves the way for a new safe treatment of snake mites (*Ophionyssus natricis*). By using living organisms to eradicate these parasitic pests, so biological control enters the reptile keeping world!



Jean de la Fontaine (1621-1695). PD

## Snake mites and their consequences...

Snake mites are a well-known threat recognised by snake breeders and most keepers. These parasites appear as fast-moving, tiny dark mites that congregate particularly around the mouth and eyes of an infected snake. They can also be found drowned in the water bowl or even squashed on the sides of the vivarium. Snake mites cause intense irritation, and as their numbers increase, so they are likely to affect the snake’s behaviour. As an example, you will probably notice that an affected snake spends much longer than usual sitting in its water bowl, trying to relieve the irritation.

This mite feeds almost exclusively on the blood of snakes, but it can also be found in cases of heavy infestation on lizards. Lizards are normally more commonly infected by other species though, such as *Ptenygosoma* and *Ixodorhynchus* among others. Vivarium conditions are perfectly suited for these pest species, leading to very serious outbreaks.

## Why is it so difficult to get rid of these parasites?

The goal of the treatment is to eliminate all parasites on the reptile and in the vivarium, but up until now, current solutions have relied on the use of chemicals that may kill the mites, but can also adversely impact on the nervous system of snakes and other reptiles which need to be treated.

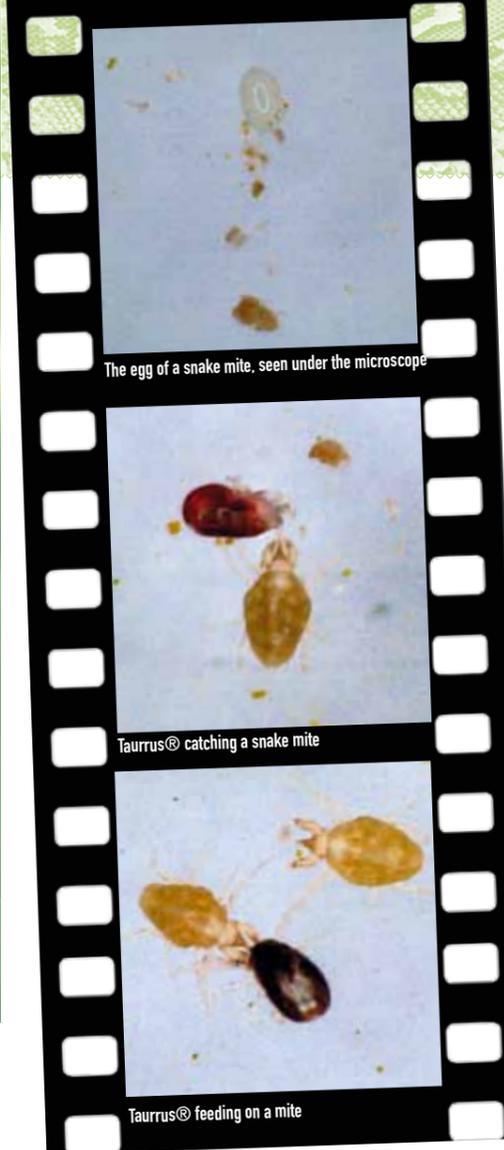
Nowadays, some insecticides give good results but their use remains difficult and protracted. Leading specialist vet Douglas Mader advises limiting their use to the most virulent parasites, in his standard work on the veterinary care of reptiles. Consulting an experienced veterinarian is

imperative in any case, so as to avoid the risk of overdosing and also the reappearance of the parasites. Indeed, none of the chemicals currently available attacks the eggs of the parasite, and so a minimum of two successive applications are needed, administered at an interval of two weeks apart, in order to destroy the subsequent generation of young mites when they hatch.

In all cases, thorough cleaning and treatment of the vivarium is essential to overcome mites that are hiding there. This constraint leads some reptile breeders/keepers to turn their vivariums into quarantine cages, replacing the natural substrates with newspaper, without any decorative elements, even if animals will benefit from a natural set-up.



Studies involving rattlesnakes helped to indicate snakes in the wild suffered less from mites



The egg of a snake mite, seen under the microscope

Taurus® catching a snake mite

Taurus® feeding on a mite

Mite photos courtesy of Chris Applin / Pilbara Reptiles

## A new predator on the scene

It was back in 1956, at a time when snake-keeping was largely restricted to zoological collections, that the herpetologist Conrad E. Yunker compared the levels of *Ophionyssus natricis* infestations in wild and captive reptiles. This key study revealed that the number of these mites affecting snakes housed in vivarium surroundings was significantly higher, suggesting the existence of a limiting factor in the natural environment, controlling the numbers of these parasites.



Green lacewing – an insect now bred commercially for the biological control of various plant pests

The obvious possibility was the presence of a natural predator of these mites. The idea of using a biological control method for snake mites was initiated in the USA, with *Hypoaspis* mites already being used worldwide as an agent of this type against sciarid flies in horticulture, and seemingly offering some potential for this purpose.

This soil-based predator takes a wide variety of prey, but unfortunately, studies revealed that it prefers small insect eggs and larvae, rather than the adult mite. Furthermore, *Hypoaspis* did not thrive in vivarium temperatures above 25°C (77°F).

It took three years of intensive research to identify, isolate and mass-rear the right candidate. Biologists from the company APPI finally found the natural predator of *Ophionyssus natricis* living alongside snakes in their burrows in the wild, although the search had been rather like looking for a needle in a haystack!

Poor results against *Ophionyssus natricis* had initially been obtained because *Hypoaspis* was actually the wrong candidate! The real snake mite predator is called Taurus®, and thrives in warm places, as in vivarium surroundings. It also consumes all stages of the parasite from the eggs through to adults. Taurus® mites occur throughout the world, and are naturally present in all European countries, mainly in reptile burrows.

## Using this method

A key feature of these predatory mites is that they are particularly effective against the immature stages of the parasite, which are the most difficult to eradicate with chemicals. Brown and small in size, Taurus® are able to tackle prey three or four times larger than themselves, including mature female snake mites, which represent the greatest threat to the snake’s health in the vivarium. The treatment consists of simply releasing these tiny predators into the enclosure, and then nature does the rest!

## What is biological control?

It is a method of using living organisms to attack and destroy pests. Although used initially to control plants pests, biological control has been used increasingly over recent years as a means of controlling parasites affecting animals as well.

No thorough cleaning of the terrarium is required after each infestation, so a naturalistic setting will not need to be pulled apart to protect the snake. There is also no need to handle the infected animal either, and no harmful side-effects are associated with this method of treatment.

“Having worked with reptiles for the past 12 years, lots of things have changed. One thing that has not is the nuisance caused by snake mites and trying to find a safe, effective way of getting rid of them,” says Chris Applin of Pilbara Reptiles Ltd., who is offering this radical treatment in the UK. “Snake mites will undoubtedly have caused a problem for anyone who has kept snakes for a number of years, especially for those with larger collections – even with the most stringent quarantine procedures.

“The biggest problem as a breeder is infected mites spreading disease throughout an entire collection. If you have found one snake with mites, it’s almost certain that every snake in that room will have them. Apart from disease, mites can cause stress, sometimes causing snakes to stop feeding as well as breeding,” adds Chris. “Until now chemical products have been the only choice, but I have often wondered how wild snakes dealt with mites, apart from shedding and bathing. Now we know! Having tested Taurus®, I am happy to be the official distributor for the UK. I believe this is one of the most important developments ever in snake keeping, and it will save many lives.” ❖

## Want to know more?

	Application	Price
TAURRUS®	treats 1 or 2 vivariums in a curative way and up to 4 vivariums in a preventive way.	£30.00
TAURRUS® L	treats 5 to 8 vivariums in a curative way and up to 15 vivariums in a preventive way.	£99.99
TAURRUS® XL	treats 10 to 15 vivariums in a curative way and up to 30 vivariums in preventive way.	£165.00

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