

EXPERIENCES WITH TWO METHODS TO CONTROL SNAKE MITES



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NOTES ON SNAKE MITES

In accordance with recent classification, the mites that attack snakes belong to the order Parasitiformes, sub-order Mesostigmata, superfamily Dermanyssoidea, and to the families of Macronyssidae, Ixodorhynchidae, Entonyssidae and Laelaptidae. They are primarily represented by *Ophionyssus natricis* and the genus *Mabuyonyssus*. They are small arthropods with an unsegmented body, bearing four pairs of legs and biting-sucking mouth organs. They have a life cycle with 5 stages: egg, non-feeding larva, feeding protonymph, non-feeding deutonymph and feeding adult.

Environmental conditions for all stages, are a of temperature range of 23-30°C and a relative humidity of 70-90%. In these conditions, the life span of adults is

10-30 days. Female mites lay one or two dozen eggs at a time (with a total of 70-80 eggs in their life) in humid and dark places.

When snake mites are in a feeding form, they settle on the abdomen, underneath the scales, around the eyes and inside the nostrils; *Mabuyonyssus* parasitizes the lung and trachea too. They cause damage not only through blood sucking and skin damage, but they can also act as vectors of other diseases (necrotic stomatitis and pneumonia caused by *Aeromonas hydrophila*) and it seems that they can also be vectors of IBD (Inclusion Body Disease virus).

TRICHLORFON

Trichlorfon is an organophosphate insecticide (dimethyl-2,2,2-trichloro-1-hydroxyethylphosphonate). It has a lot of common trade names, the most well known is Neguvon. It is classified by the U.S. Environmental Protection Agency (EPA) as a General Use Pesticide (GUP). It is in toxicity class II (moderately toxic).



Elaphe obs. quadriv. Photo: Leo Brand Vol. 2(3)

Trichlorfon

Species	Age	Visible toxic effects
<i>Boa constrictor</i>	young	no
<i>Elaphe guttata</i>	adult	no
<i>Elaphe mandarina</i>	adult	no
<i>Elaphe obsoleta quadrivittata</i>	young	yes
<i>Elaphe quatuorlineata</i>	young	no
<i>Epicrates cenchria maurus</i>	young/adult	no
<i>Eryx johnii</i>	adult	no
<i>Python regius</i>	adult	no
<i>Python reticulatus</i>	adult	no
<i>Python sebae</i>	young	no
<i>Thamnophis</i> sp.	young/adult	yes
<i>Xenopeltis unicolor</i>	adult	no

It is commonly obtainable as a soluble powder. This insecticide is toxic to target arthropods, through direct applications (dermal absorption) and via ingestion. It affects the nervous system through inhibition of cholinesterase enzyme, which is necessary for normal nervous system function. Its toxicological effects include acute toxicity (headache, giddiness, nervousness, blurred vision, weakness, loss of muscle and reflex control) and chronic toxicity (disorientation, depression, confusion, delayed reaction times). It is suspected of having negative reproductive effects, teratogenic, mutagenic and carcinogenic effects.

I used Neguvon (soluble powder) to eradicate a serious infestation in my snake collection some years ago. I sprayed cages with 0.3% Neguvon solution, I sealed the cages and I left the Neguvon to act for some days. At the same time, I put each snake inside a cotton sack treated (but not soaked) with a 0.2% Neguvon solution. Then I put all cotton sacks into a plastic box with ventilation holes for 24 hours at 26-28°C. This temperature was maintained to allow high humidity, so the water vapour was a good trichlorfon carrier. In this way, trichlorfon acted through dermal absorption and inhalation of water vapour. After the treatment, all snakes were fine except for young specimens of *Elaphe obsoleta quadrivittata* and *Thamnophis* sp., which pre-

sented an evident loss of reflex control and head trembling. These symptoms vanished completely after 3 days. With this method, I unquestionably eradicated the snake mite infestation. I occasionally use the same method in order to kill possible mites on newly acquired snakes.

DICHLORVOS

Dichlorvos is another organophosphate compound (2,2-dichlorovinyl-dimethylphosphate). The most well known trade name is Vapona. It is classified by the U.S. Environmental Protection Agency (EPA) as a Restricted Use Pesticide (RUP) because its toxicity is of class I (highly toxic) and it may cause cancer. It is primarily used as a fumigant (pest strip). Dichlorvos is toxic to target arthropods through inhalation, ingestion and dermal absorption. As with trichlorfon, it affects the nervous system through inhibition of cholinesterase enzyme. It is rapidly metabolized and eliminated from the body, so it causes a rapid onset of symptoms. These include: delayed reaction times, headache, weakness, nervousness, blurred vision, giddiness and loss of muscle control. Dichlorvos is suspected of having negative reproductive effects and teratogenic effects; besides it is certainly mutagenic and it is very probable that it is carcinogenic too.



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I used Vapona (pest strip) to kill snake mites in a snake collection of a friend. I put pieces of pest strip into 35mm plastic film containers, in which I made small holes for ventilation. I used pieces of 1x1 cm for cages of 20x15x13 cm (volume = 3900 cm³). Then I put these 'pest containers' in the snake cages for 3 days and repeated that after 3 weeks. The temperature was 26-30°C. During the fumigation (dichlorvos acted by inhalation), the snakes had no food or water. All mites died and the snakes didn't show any symptoms. I usually use a single short exposure, of 24 hours only, on new acquired snakes.

CONCLUSION

The use of trichlorfon seems to be a very effective method to eradicate massive snake mite infestation. It

is important not to exceed the dosage of 0.2-0.3% in solution, as it may be dangerous on young snakes and on species which have a thin skin. The toxicity of trichlorofon often has reversible negative effects but this compound may be fatal for sensitive snakes too. For this reason, it is advisable to use it specifically on adult snakes.

Dichlorvos is another good toxin to use on snake mites. It needs to be repeated after at least 3 weeks, but it may be used with more safety on young and sensitive snakes. It acts by inhalation and it is rapidly eliminated from the body of the snake. It may also be used as a preventive method on new acquired snakes, as it is simple and fast.

Dichlorvos

Species	Age	Visible toxic effects
Coluber hippocrepis	young	no
Coluber viridiflavus	young	no
Coronella girondica	young	no
Elaphe bimaculata	adult	no
Elaphe guttata	young/adult	no
Elaphe longissima	young	no
Elaphe quatuorlineata	young	no
Elaphe situla	young	no
Epicrates cenchria cenchria	young/adult	no
Eryx conicus	young	no
Python curtus	young/adult	no