
PENNYROYAL

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Treating Snake Mites and Ticks

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Snake Mites:

Snake mites, *Ophionyssus natricis*, multiply rapidly in a reptile collection and are capable of causing severe illness and debilitation. One mite lays 60 to 80 eggs, and each egg can hatch and mature into an adult mite in just 21 days. Thus one pair of mites in theory could produce 80 mites after 21 days, 6,400 mites after 42 days, and over 500,000 mites after 63 days. In severe infestations, a single snake host may support 10,000 to 20,000 mites. Mites damage the skin, cause severe blood loss anemia, and transmit infections such as *Aeromonas hydrophila*. It is important to quarantine new additions to a reptile collection for 3 months to prevent the introduction of mites. It also is important to treat collections that are infested with mites.

Mites are difficult to eradicate, because, like fleas, the animal AND the environment must be treated. No insecticide is tested or approved for use in reptiles and the use of insecticides may result in toxic side effects.

Treatments NOT to Use (but that you may have heard about):

Pyrethrin flea sprays have been reported to cause shock and convulsions in snakes. Although these symptoms, when mild, can be

controlled with medication (atropine and diazepam), fatal reactions are possible. Thus pyrethrins must be used with extreme caution in snakes, or not at all.

Vapona pest strips (No Pest Strips) have been the historical treatment of choice, but many populations of mites have developed resistance and it is not a very effective remedy any more. Likewise the formula for the strips has been changed and the new formula has a greater potential to cause toxicity. These have been reported effective at a dose of one eighth of a strip in the cage with the snake for 3 hours, twice a week for three weeks. The piece of vapona strip is placed in a plastic container (like a butter dish) with holes punched in it to prevent the snake from coming in direct contact. Likewise, the water dish should be removed during treatment. Other reports suggest bigger pieces and longer periods of exposure, but no scientific studies have been done to learn a safe and effective dose. This treatment is mentioned because it is in the literature, but it should be stressed that the use of vapona strips has fallen out of favor.

Another method reported by one herpetologist (not a veterinarian) is to clean and dry the cage, removing all cage furniture and bedding including the water

bowl but leaving the hide box in place. This may be discarded later if cardboard or rinsed off if plastic. A light dusting (this is NOT a case where more is better – rather a little is just enough) of 5% carbaryl powder (Vet Chem Flea Powder, Sevin Garden Dust) is placed on the floor of the cage and the snake is left in the cage for 24 hours. Then the snake *and* cage are rinsed off and the water bowl and *new* bedding and *new* driftwood are replaced. Treatment may be repeated once or twice at 10 day intervals. This method has not been tested in large numbers of snakes, and small, delicate species may be more susceptible to toxic side effects than others. I am suspicious that a shorter time of exposure to the carbaryl, say 2 to 4 hours, would be just as effective and have less potential toxicity. It has been reported that snakes might develop severe lung irritation from breathing this dust, and this, along with a lack of studies to prove safety and efficacy is why carbaryl is not the treatment of choice.

Treatments to Use:

Boyer (Boyer, D.D., 1995. Snake Mite (*Ophionyssus natricis*) Eradication Utilizing Permethrin Spray, *Bulletin of the Association of Reptilian and Amphibian Veterinarians*, 5(1):4-5.) reports the

successful use of Permethrin II (Bio-Ceatic) in treating a large number of snakes and a few lizards at the Dallas Zoo over an 18 month period. This is as close to a scientific study as is currently available, and was done by respected herpetologists at a respected institution. Their protocol follows:

Permethrin Mite Treatment Protocol:

- 1) Do NOT use Permethrin in conjunction with any other insecticide products or toxicity may result. Wait 3 to 4 weeks after use of other products before using Permethrin.
- 2) Permethrin comes in a 10% solution and by law must be sold in its original packaging with full information and warning labels attached. However, it must be diluted to a 1% solution and placed in a spray bottle (like a plant misting bottle) for use in reptiles. Add 9 parts tap water and one part Permethrin to make a 1% solution. Wear gloves and eye protection during handling to prevent human exposure. Do not mix insecticides in the kitchen or bathroom where teeth are brushed. Label containers containing Permethrin "poison" and prevent children from access to these products. Use common sense.
- 3) Treat the cage(s):
 - Discard cage substrate and props if possible.
 - Disinfect water bowls, hide boxes, and enclosures with dilute bleach (1 ounce bleach in a quart of warm water).
 - Thoroughly rinse any residual bleach solution away with a sponge and clean water.
 - Allow enclosures and other items to dry.

- Thoroughly spray the cage interior and any props with diluted 1% Permethrin in a well ventilated area. Lightly spray the outside of the cage and the surrounding area.
 - Remove any excess Permethrin with paper towels.
 - Allow sprayed areas to dry.
- 4) Treat the Reptile(s):
 - Remove any reptiles to be treated to a clean, well-ventilated enclosure.
 - LIGHTLY spray the reptile over the entire body including the ventral aspect and remove excess solution with paper towels.
 - IMPORTANT: Keep the Permethrin spray out of the mouth of the reptile. Apply Permethrin to the head (or the entire body of small, delicate reptiles) by spraying a cotton ball or piece of gauze and painting it on. If you accidentally get spray in the reptile's mouth, immediately rinse it out with lukewarm tap water.
 - Keep the reptile in this enclosure for 24 hours.
 - 5) Timing of treatments:
 - Repeat the entire procedure in 10 days. If mites are still present after the second treatment, do a third treatment (reptile AND cage) 10 days after the second treatment.
 - Wash reptiles with water one day prior to additional treatments.
 - Use paper as a cage substrate during treatment. Replace the paper and disinfect the cage every 2 days during treatment.
 - Apply Permethrin spray during office hours, rather than late at night or on weekends. Thus, if any toxic side effects occur,

treatment is readily available. Remember, NO INSECTICIDE, including Permethrin, is tested or approved for use in reptiles. Any use of insecticide in reptiles is at the owner's risk.

Ivermectin, an insecticide that may be given orally or preferably by injection at 10 to 14 day intervals, is also safe and effective. This may be a safer product than Permethrin for small and delicate reptiles. It is impractical to use Ivermectin in large collections. When Ivermectin is used the enclosures still have to be treated as described above to eradicate the rest of the mite population.

Ticks: These may be removed individually with forceps. Ticks may be killed prior to removal with local application of 5% carbaryl dust or diluted 1% Permethrin, or with the use of ivermectin given by injection or orally. Treatment of the environment is rarely necessary. Ticks are often overlooked until they become engorged with blood. When removing them with forceps, care should be taken to avoid crushing them and pushing their contents, which may contain infectious diseases, into the snake. Gentle traction is applied until the mouth parts fatigue and the tick lets go. It is rare for mouth parts to be left behind when they are pulled off with gentle traction rather than with a quick yank. And even if mouth parts are left behind, they usually come off with the next shed. Complications are rare.