

THE HUSBANDRY OF THE TEMPLE VIPER (*TRIMERESURUS*
WAGLERI).

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DESCRIPTION

Trimeresurus wagleri comprises three subspecies:
Trimeresurus wagleri wagleri, found in Thailand,
Malaysia, the Indonesian Archipelago, and the
Philippines; *Trimeresurus wagleri alboviridis*,
found on the western island of Negros in the
Philippines; *Trimeresurus wagleri subannuloks*,
found on the island of Mindanao in the Philippines.
The rest of this article does not concern the last
two subspecies.

Many keepers of venomous snakes agree that the
temple viper, or Wagler's pit viper, is one of the
most, if not the most beautiful snake of them all.
It is a stout-bodied, arboreal pit viper with a
large heart-shaped head distinct from the neck.
The eye has a vertical pupil and is relatively
small. The scales are keeled. Adult specimens ex-
hibit a yellowish-green to white ground colour
which becomes dark green or black towards the
middle of the back. Yellow bands are found along
the entire length of the body. The green scales
are outlined in black. The head is patterned in
yellow and black. The supra- and infralabials
are yellow. A black band runs from the eye to the

neck. The belly is greenish with yellow spots and the tail is black.

Juvenile specimens, in contrast to the adults, have an entirely green ground colour. At this early stage in their lives, they have only a simple pattern of a few narrow red bands each with a white or yellow edge. These edges may also be blue or purple. On rare occasions, young specimens may have a blue tint and be covered with red specks. When the young reach a length of about 40-60 cm, their ground colour starts to become vague and they begin to assume the adult colour phase.

The temple viper acquires its name from its occurrence in the Snake Temple on the island of Penang in Malaysia. Because of their remarkably good temper, they are often handed to tourists in order to make souvenir photographs.

OBTAINING MY SNAKES

Obtaining a healthy temple viper is easier said than done, such that the number of people able to keep this snake is small. It may also be the reason why nobody to my knowledge has bred this species in captivity.

Animals sold by reptile dealers are generally in a poor state of health due to the way they were treated by the snake hunters in Thailand, during transport to Bangkok, by the animal dealers there and during the trip to Europe.

There is, however, a way of acquiring a healthy specimen. Every spring, a number of female specimens are imported of which a few are usually pregnant. Normally, a female temple viper gives birth to between ten and fifteen young at a time, so there are usually enough to go around. A new-born *Trimeresurus wagleri* measures approximately 20 cm in length.

It is at this stage that the problems begin. These

young captive born temple vipers are susceptible to pneumonia. This is often fatal and is the major cause of death. Sometimes they die suddenly for no apparent reason, even though they seemed to be doing fine.

DESCRIPTION OF MY SPECIMENS

In April 1981, I obtained two temple vipers which were about two weeks old, 18 cm long and weighed only 4 g each. They had already sloughed once. I put them in a small cage measuring 30x20x25 cm (lxwxh) containing a few small branches.

One year later, both snakes had shed five times and had reached a length of 27 cm. During that time, each had independently eaten fifteen pinky legs and twelve pinkies. One of the two was force-fed only once. They ate about once every two weeks. After another fifteen months, the two snakes had reached a length of about 43 cm and weighed about 40 g. During that period they each sloughed another four times and ate a small mouse about every one and a half weeks. Also, their colour had changed slowly to dark green and they had become speckled with small black spots. The tail was now black with light yellow spots. At about the time I received my own specimens, I knew there were another fifty or so temple vipers distributed amongst other keepers in the Netherlands. After making enquiries, I learned that all but four had died, sometimes due to unknown causes. Most of them were all kept in the same manner: in a medium to large cage with a high humidity level of about 90%, a temperature of approximately 28°C and in unhygienic conditions. Practically all of them had to be constantly force-fed.

HUSBANDRY

The husbandry methods I used on my temple vipers differed from those used by my fellow snake keepers. I had heard that in previous years many problems had arisen using standard procedures. I decided to take a different approach to the problem and this I believe was the reason for my relative success.

Keeping young specimens in large cages has several drawbacks. The snake has a smaller chance of discovering its prey and the temperature and humidity in the cage are so variable. The level of humidity I maintained was low in comparison to the standard - just high enough so that the snakes would not develop the wrinkled skin of dehydration. During the day the humidity level was 65%, and at night it would rise to 70% due to the drop in temperature.

The temperature maintained was also comparatively low. During the day the temperature would not exceed 24°C, although this was difficult during the warm summer months. At night I dropped it down to 20°C. During the winter months the average temperature was lower - 20°C during the day and 18°C at night. I did not maintain these temperatures with the usual lightbulb or heating element, but simply with the room temperature and maybe just a little heat from a terrarium underneath. I did this as most snakes stay too near a lightbulb and dehydrate, especially when they are small. The terrarium was placed about one metre from a window to the north so that the snakes received sunlight. It is very important to keep this species as hygienic as possible. They are very susceptible to a wide range of infections. One must also be careful about draughts and sudden temperature changes because the snakes may catch cold. Such colds can easily develop into pneumonia and other bronchial disorders.



Foto 1. *Trimeresurus wagleri*. Foto: Anton van Woerkom.

A wooden terrarium with the bottom covered by a layer of peatdust is considered more natural and appealing to look at than a bare, sterile cage. However, many pathogenic bacteria multiply easily in damp peatdust or on damp wood, and animals become more easily infected.

Many species are force-fed, especially as hatchlings, but it can be too traumatic for species such as *Trimeresurus wagleri* which have a low stress-tolerance. Therefore, I believe it is better to leave the newly acquired specimens alone as much as possible. Under such circumstances they have a better chance to adjust to their new surroundings. If, after a few weeks, they have not yet started to feed independantly, one of the following methods may be applied:

1. Put the snake and a pink mouse in a very small dark and completely closed box (for example 10x5x5 cm).
2. Same as 1., except kill the pinky and cut it open so that it is smeared with blood.
3. Rub the pinky against a lizard and then offer it to the snake.
4. Offer the snake a small lizard first; if this is accepted, offer it a pinky immediately afterwards.
5. Cut a freshly-killed pinky into several pieces and wait for the blood to clot and dry slightly. Pick up a piece of meat with a pair of tweezers and annoy the snake until it bites the piece of meat. Because of the partially dried blood, the piece of meat will stick in the snake's mouth, forcing it to eat. One might also try dipping the pieces of meat in egg-white so as to make them stick even better.

The last method is my personal favourite. All of the above methods should be carried out in the evening as *Trimeresurus wagleri* is a nocturnal species.

If after about two months the snakes still have not started to eat, force-feeding may be considered.

Actual force-feeding should be done as carefully as possible with small pieces of meat, like the head of a pinky mouse. Do not use any tooth-picks or other wooden objects when force-feeding, as these tend to be sharp and there is always the danger of a splinter getting lodged in the snake's mouth. It is best to use a pair of tweezers with a round tip and a stout probe. Finally, complicating the entire process of force-feeding (which is an art in itself) is the fact that we are dealing with a venomous snake, which has always a certain amount of risk involved. Although the venom of *Trimeresurus wagleri* is not very strong

(Trutnau, 1981), the depth of the wound and the amount of venom injected can easily result in an ugly wound or even be dangerous.

VITAMINS

During their first year of life, it is important that the snakes receive enough vitamin A and D₃ so that they slough properly and as a preventive measure against rickets. I prefer two particular methods of administering this vitamin supplement. The first consists of applying one drop of A and D₃ on a pinky mouse before feeding it to the snake. This should be done about once a month. The other, a much shorter term method, involves spraying the cage once every two days with an A and D₃ solution; the snakes drink the droplets from the sides of the cage. I always use the latter method, adding five drops of Dohyfral A + D₃ (aquosum) to 1 litre of water.

The snakes can also be given a vitamin B-complex occasionally, especially in the beginning when they are fed primarily on small pieces of pinky meat (incomplete diet).

PNEUMONIA

A month after it had changed its colour, the first specimen died of pneumonia and so after a while did the second animal. At the end of June 1983 both snakes had not been fed for over a month due to lack of prey animals. I had only been able to offer one little frog, which had been swallowed by one of the snakes in the same way as the pinkies had normally been. Some days after having eaten the frog the snake caught pneumonia and died twelve days later, despite being treated. The second animal also died within a few weeks after

the first, also of pneumonia. I had fed a little frog some days before again, and the circumstances under which the pneumonia happened, were the same. It might therefore be asked if the feeding of that frog has something to do with the pneumonia. However, the infection of the second animal by the first is not to be excluded. Directly after the first specimen had died, the same bacterium was not found in the phlegm of the second one, though later on this was indeed the case.

PSEUDOMONAS AERUGINOSA

A cultivation was made of the sputum of both snakes and from these cultivations in both cases *Pseudomonas aeruginosa* was isolated. *Pseudomonas aeruginosa* is a gram-negative bacterium. It is a slender bar-formed bacterium of 1.5-4 μ length and 0.5 μ width. It is mobile by means of a polar flagellum, is non-sporing and seldom capsulate. On a laboratory medium the colonies are large, low convex with an irregular surface and edge which is translucent. The colour is nacreous grey, later on changing to yellow-green, blue or brown. *Pseudomonas aeruginosa* grows mainly aerobe and easily on all media. Growth is possible with citrate as only source of carbon. The methyl-red reaction and the reaction of Voges Proskauer are negative. Nitrate is reduced to nitrite and further on to nitrogen. Growth is possible between 4 and 42°C, the optimal temperature being 37°C. Cultivations of *Pseudomonas aeruginosa* smell spicy. Several pigments are produced, among which the blue pyocyanin and the yellow-green fluorescent fluorescin, causing a greenish-blue sometimes yellowish-green colouration of the medium. *Pseudomonas aeruginosa* is widely spread, remains harmless on the skins of humans and animals, unless damage of the skin enables the bacterium to enter the subcutan-

eous tissue. It needs a moist environment for its development.

A normal healthy animal is protected against this bacterium by its immunosystem. If it is ill-fed, or ill, the bacteria are able to penetrate and cause poisoning of the blood, killing the animal within a couple of hours. The infection is highly contagious. An infected animal can easily infect another animal in the same terrarium. As a pathogene in snakes, *Pseudomonas aeruginosa* is especially famous as the cause of stomatitis ulcerosa (mouth rot).

Besides *Pseudomonas aeruginosa*, also found in the sputum of the snakes: *Escherischia coli*, *Proteus morgani*, *Streptococcus* and *Citrobacter*, though these were found in such small concentrations that there was no case of real infection by these bacteria.

MEDICATION

Sensitivity-tests were carried out on cultivations of *Pseudomonas aeruginosa*. It appeared that this bacterium was sensitive for gentomycin and moderately sensitive to kanamycin and chloramphenicol. Nevertheless, chloramphenicol was the chosen therapy in a dosage of 40 mg/kg bodyweight each day, intramuscular. With the first snake with pneumonia, the cure lasted for five days, with the second snake eight days. Also, vitamin B complex was given, once, in a dose of 0.5 ml/kg, and the temperature was raised to 30°C. The animals were separated immediately.

The first snake died twelve days after the discovery of the illness, the second after fourteen days, before treatment with gentamycin could be started.

At first, gentamycin had been rejected because of its toxicity. It can cause neurologic damage. Its

effectiveness is due to the fact that it disturbs the protein synthesis of the bacterium. The snakes in question, having a bodyweight of about 40 g, would in case of treatment with gentamycin in a dose of 2.5 mg/kg, have needed such a small quantity of active component that the danger of an overdose would have been too great.

The cause of death has probably been exhaustion, suffocation and the infection of other organs. Postmortem examination showed infections in the liver, the kidneys, the brains and ofcourse the lungs.

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