CAUDAL LURING OF SOME SNAKES

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INTRODUCTION

Caudal luring is described as the wriggling or waving of a conspicuously coloured tail by an otherwise cryptically marked snake. This wriggling is intended to attract prey animals until they are within striking range.
The question is in which species does caudal luring occur, under what circumstances is it used, and whether it occurs in adult animals as well as in juveniles. This article is meant to consider these questions. It is partly based on earlier articles, partly on the authors own experiences.

IN WHICH SPECIES

Caudal luring has been described in crotaline snakes, but on some occasions also in non-crotaline. There are for instance two vipers that have been reported to lure, namely *Cerastes vipera* and *Vipera russelli*. Furthermore, luring is known in the viper-like elapid *Acrantophis antarcticus*. In this article you will also find data about young specimens of *Boa constrictor occidentalis*, and of course about *Chondropython viridis*.

IN WHICH TYPES

In which types of snake does luring occur? At first, it was described in terrestrial snake species, but later on also in tree dwelling species like *Bothrops bilineatus* and *Chondropython viridis*, so the question whether the snakes are terrestrial or arboreal does not seem to be of any importance.

ONLY YOUNG ANIMALS

Apart from *Cerastes vipera* and *Bothrops bilineatus* caudal luring according to some authors was supposed to be restricted to juvenile animals. That this supposition is not correct, I will prove for at least one species, namely *Chondropython*.

CHONDROPYTHON

In 1978 Murphy, Carpenter and Gillingham described the caudal luring in juvenile specimens of *Chondropython viridis* when prey was offered. The animals were about 45 cm in length when the observations started. The ambient temperature varied between 27-36°C, the relative humidity averaged 50%. Caudal luring was observed more than 50 times when rodent prey was offered, and on four occasions the snakes lured anoles that were loose in the laboratory. The anoles vigorously tried to seize the snake tails through the glass of the terrarium.
The authors filmed the caudal movements and made the sketches that were copied for this article.

COLOUR OF TAILS

The frequency of occurence of the caudal luring diminished over a period of 28 months, which corresponded in part with the ontogenetic colour change of the animals. The tails were in the beginning sulphur yellow, strongly contrasting with the originally brown body colour of the juvenile snakes. The colour of the animals changed to green and the colour of the tails changed along, growing virtually indistinguishable from the body ground colour.
The authors consider this as a confirmation of their presumption that caudal luring only occurs in animals with a conspicuously coloured tail. Furthermore they noticed that the caudal luring was very intensive when laboratory mice were offered. They suggest this might indicate that the lure could be succesfully employed by this species for the capture of insectivorous marsupial mammals. Avian and reptilian prey might also be attracted by luring.

CONTRADICTORY EXPERIENCES

Observations on my own 4 specimens of *Chondropython* partially confirm the above mentioned opinions, but are contradictory on at least one point.
My animals are adult and their colour had already changed to green when I got them. They are all born in 1983 and at the time of this writing are 6 years old. The tail was in all specimens in the beginning coloured bluish black, which strongly contrasted with their green body colour. The tails have become lighter through the years: in two specimens it has become almost uniformly green with conspicuous black

spots, in the other two there is almost no dark pigmentation left.
As for this, there is a clear difference from the animals of Murphy a.o., in which the contrasting colouration of the tail disappeared immediately when the overall colour of the animals turned to green.
More important, however, is that the caudal luring in my animals did not disappear but remained as intensive as ever up to the present day. They all still make the characteristic wriggling caudal movements when hunting during the night, hanging over their branches, observing every movement in the room. I must add that I never attempted to find out if they also make these movements when there is nothing moving in the room. To find this out, one should install a videocamera and leave the room.

CONCLUSION

My conclusion is, that at any rate it is <u>not</u> true that only juvenile specimens practice caudal luring. Furthermore, I do not assume that they will ever stop making these movements when there will be not any dark pigmentation left on their tails, as in two animals this is virtually already the case and there is still no difference at all.

BOA CONSTRICTOR

Radcliffe, Chiszar and Smith (1980) describe caudal luring in two juvenile *Boa constrictor occidentalis*. These animals were kept rather warm (29-32°C by day, 24-27°C during the night) and fed minimally with one small mouse at weekly intervals. These

conditions made them very hungry, which resulted in their being very alert, orientated on movement and ready to feed. Both snakes responded to the sight of food with wriggling tail movements on at least four occasions, but they did not always react this way under the same conditions. The caudal movements were wormlike and enhanced by the fact that the tails were marked somewhat more vividly than the body. These tail movements most often occurred when they prey was moving out of sight. When a live mouse was introduced in the cage, the snake would slowly start to crawl toward it, keeping the head and neck in a S-shaped striking position. When the mouse went behind a rock or stopped moving, the snake would start wriggling its tail, without moving the rest of its body. However, when the mouse reappeared or started moving again, the wriggling of the snake's tail stopped and the snake started to advance again. Twice, the moving of a finger along the bottom of the glass front induced the wriggling tail movements.

EXPLANATION

The authors believe that the described behaviour, though not as well developed as for instance in *Agkistrodon bilineatus*, must be considered as caudal luring and as a normal part of this snake's feeding sequence. The reasons herefore are:

1: the movements are wormlike and might attract a lizard or small bird which even these juveniles could eat;

2: the tail movements were easier to elicit when the snakes were hungry and very difficult when they had been recently fed, which suggests that the

motivational state of the snake was a critical factor;

3: the behaviour was elicited by the sight of mice or by hand movements near the cage which may have been interpreted as prey, but never by disturbing the snake in ways that were clearly not prey related, such as cleaning the cage.

The authors also suppose that the primitive caudal luring of this boa may be considered as a first step in the evolution of more complicated caudal luring as found in other snake species.

That this behaviour only occurs just after the prey has gone out of sight, they consider as an indication that the caudal luring finds its origin in displacement activity or 'outlet'-activity. They present the possibility that if the boa observes prey, neurological and physiological reactions such as hyperventilation and tachycardia occur, which reactions 'prepare' the animal for the attack. If the external stimulus suddenly disappears, the internal reactions have started, cannot be stopped easily. Caudal luring behaviour seems to be limited to species that would be described as ambush predators. Moving in the direction in which the prey disappeared, does not belong to their hunting behaviour and would in fact be able to frighten the prey away and prevent its returning. The tail movements might be considered as a behavioural outlet for the above mentioned internal reaction chain.

LITTERATURE

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