

**COMMENTS ON CAUDAL LURING IN SNAKES
WITH OBSERVATIONS ON THIS BEHAVIOUR
IN TWO SUBSPECIES OF CANTILS,
AGKISTRODON BILINEATUS SSP**

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INTRODUCTION

The use of a light-coloured tail, in juvenile snakes, as a caudal lure has been reported in the literature numerous times since its original description by Ditmars (1907). Perhaps the most accurate description of this behaviour that I have read was that given by Heatwole and Davison (1976), who stated 'Caudal luring is the waving or wriggling of a conspicuous tail by an otherwise cryptically coloured snake, thereby attracting small animals which attempt to feed on the worm-like or caterpillar-like tail but themselves become prey when they come within striking distance of the snake.'

Most commonly, this behaviour has been reported for various vipers. and pit vipers, but it has also been observed in elapid snakes. Some of the more popular accounts of this behaviour, including two comprehensive reviews, can be found in Allen (1949), Atz (1950), Carpenter, Murphy and Carpenter (1978), Greene and Campbell (1978), Heatwole and Davison (1976), Henderson (1970), Henry (1925), Jackson and Martin (1980), Kauffeld (1943), Neill (1948, 1960), and Wharton (1960).

COMMENTS ON CAUDAL LURING IN SNAKES

Literature accounts have reported that caudal luring is a response to a stimulus such as visual, olfactory, or infrared detection of prey which, in most cases, was introduced into the snake's cage. Occasionally, however, some accounts are incomplete, containing no information as to which, if any, stimulus was responsible for evoking this behaviour. Interestingly, I have been unable as of yet to find a published account of caudal luring that occurred in the absence of any of the external, physical stimuli associated with prey detection.

If a snake did display a caudal lure in the absence of detectable prey, it might be suspected that some other physical stimulus such as movements of an observer, movements of animals in adjacent cages, or vibrations detected by the snake may have elicited this behaviour. If stimuli such as these can be excluded, then it seems possible that an internal stimulus such as hunger might have triggered the luring behaviour.

Neill (1960) stated 'It is also possible that an internal stimulus, hunger, combines with external ones to bring about luring behaviour.'

OBSERVATIONS ON CAUDAL LURING IN CANTILS

The following accounts of caudal luring in four juvenile cantils, *Agkistrodon bilineatus* ssp. seem to be examples of this internal stimulus. I believe that the luring behaviour in these cantils was probably the result of hunger, primarily because physical stimuli such as those mentioned above were seemingly non-existent. Each time that luring occurred, the author observed that his motions, or those of snakes in cages adjacent to the cantil's, were either non-existent or non-detectable by the luring snake. It should also be pointed out that in each of instance of luring there were no food animals in the room, thus eliminating olfaction as the stimulus that evoked this behaviour. Admittedly, there could have been some other physical stimulus of which I was not aware; this seems highly unlikely, however.

Since 15 July 1978, I have raised three juvenile Mexican cantils, *Agkistrodon bilineatus bilineatus*, to adulthood. In addition, a juvenile specimen of the ornate or Taylor's cantil, *Agkistrodon bilineatus taylori*, is currently being raised in my collection. All of these cantils were maintained, singly, in plastic containers measuring approximately 41 x 28 x 17 cm (16 x 11 x 7 in). Newspaper was used as a substrate and a small water-filled bowl was available at all times. Each cage was also supplied with a small plastic retreat box, although this was infrequently used by the snakes. Diurnal light cycles were maintained with the use of fluorescent lights and timers.

Four species of lizards were offered as food: green anoles (*Anolis carolinensis*), five-lined skinks (*Eumeces fasciatus*), European wall skinks (*Podarcis muralis*), and Northern fence swifts (*Sceloporus undulatus hyacinthinus*).

During the approximately 9,5 years that I have maintained these cantils, I have been fortunate enough to have observed caudal luring in each specimen. The information contained below relates these observations with as much detail as possible and was taken from written records and from memory.

AGKISTRODON BILINEATUS BILINEATUS #1

The first juvenile specimen of *Agkistrodon bilineatus bilineatus* was a female that was received on 15 July 1978 from a dealer in Miami, Florida. At the time of its arrival, this specimen had a total length of 25.4 cm (ten inches).

Caudal luring by this specimen was observed at infrequent intervals during the first 8-10 months of captivity. However, no accurate records of this behaviour were kept at that time. In most instances, the tail was held in a vertical position approximately 4-5 cm above the snake's body. The tail tip was usually held in a stationary, hooked position. On occasion, however, the tail tip was wriggled or undulated for periods of approximately 5-10 minutes. Luring was only observed during daylight hours and occurred when the specimen was either lying on the cage substrate or resting on the top of its plastic retreat box.

It is interesting to note that in every instance of observed caudal luring, this specimen was found with its tail already in an elevated position. Not once was this cantil observed to elevate its tail or wriggle its tail tip in response to the presence of an introduced lizard or, for that matter, any other stimulus. Attempts to induce caudal luring in this snake, by hand movements, always met with failure.

It is also interesting to note that if this snake was in a coiled, resting position when a lizard was introduced into its cage, it would not commence luring but, instead, would strike quickly and retain a grip on its prey. Moreover, the introduction of a lizard while the snake was in a luring position (tail elevated but stationary), failed to elicit any wriggling of the tail tip. Instead, the prey animal was either struck at immediately, or ignored.

AGKISTRODON BILINEATUS BILINEATUS #2 EN #3

The second and third specimens of *Agkistrodon bilineatus bilineatus* were received on 20 December 1982, from a dealer in Miami, Florida. Upon arrival, #2 had a total length of 29.2 cm (11.5 in) and #3 had a total length of 27.9 cm (11 in). No. 2 is a male and No. 3 a female.

Caudal luring in both of these specimens was observed on numerous occasions both by me and by Don Lunsford. Luring occurred during the first 10-12 months in captivity and was similar to that described above, in that it was only observed during daylight hours and it always occurred in the absence of prey animals or their detection. Attempts to induce caudal luring in both of these specimens by hand movements also met with failure.

Frequently these snakes were found with their tails elevated, but stationary. On other occasions, the tails tips were wriggled but the remainder of the tail was in an elevated, stationary position. In both of these situations, the tail was elevated approximately 4-6 cm above the snake's body.

It should be pointed out that on several occasions, luring occurred when the period of time between feedings was extended to two weeks or more. This was approximately two times the normal period between feedings, and the cantils appeared to be hungry, as evidenced by their increased activity.

AGKISTRODON BILINEATUS TAYLORI #1

On 17 November 1987, I received a juvenile female Taylor's cantil, *Agkistrodon bilineatus taylori*. This specimen had a total length of 26.7 cm (10.5 in) and weighed 13.8 g. It has been maintained in captivity for approximately four months during which time caudal luring has been observed on only one occasion. This occurred on the evening of 27 February 1988.

In this particular instance of caudal luring, I had been working on the other side of the room from where this cantil's cage is located. A large, wooden cage effectively blocks the view from one end of this room to the other. Because of this, I feel sure that my movements were not detectable by the snake and that they could not have elicited the luring behaviour. I first observed this cantil from a distance of about five meters (16 ft) and noticed that it was lying on top of its plastic retreat box in a coiled position. The tail was elevated in a vertical position, approximately four cm (1.5 in) above the snake's body, and the tail tip was being wriggled. This behaviour continued for approximately five minutes, after which time observations were discontinued.

Luring by this specimen occurred even though no prey had been introduced to its cage. Moreover, I could not detect any other stimulus, visible by the snake, which might have triggered this behaviour. The snakes in the cages adjacent to the cantil's were motionless and it is improbable that they would have elicited this behaviour in the cantil.

CONCLUSIONS

Considering the information presented above, it seems highly probable that caudal luring in these cantils was evoked, at least in part, by hunger. Further investigation into 'hunger induced' luring will, hopefully, be carried out on five Juvenile Eastern cottonmouths (*Agkistrodon piscivorus piscivorus*) that are currently being maintained in my collection. Furthermore, it is hoped that more information on this aspect of luring will be obtained from discussions with other people who have observed this behaviour in their captive snakes. Anyone with such information is encouraged to contact me.

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