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## The First UK Captive Breeding of Taylor's Ornate Cantil. *Agkistrodon bilineatus taylori*.

Mark O'Shea  
Curator of Reptiles,  
West Midland Safari Park,  
Bewdley, Worcs., UK

### Background to the species

The American members of the genus *Agkistrodon* comprise three species, two of which are well-known N. American species: the copperhead *Agkistrodon contortrix* and the cottonmouth or water moccasin *A. piscivorus*. The third species is less well known to Europeans, probably because its distribution is confined to Mexico and northern Central America. *Agkistrodon bilineatus* was occasionally known as the 'highland moccasin' or 'Mexican water moccasin' but these names are erroneous since it occurs from sea-level to 1500 m and is not as aquatic as its N. American cousin, showing a marked preference for dry forest (Gloyd & Conant, 1990). The species has many regional names across its extensive, and in some places disjunct, range and it is one of these which has now generally become accepted as the preferred common name - Cantil. The erroneous use of the names 'highland moccasin' may have arisen from a misunderstanding of the root of the word cantil which in Spanish means 'steep rocky precipice or cliff' suggesting to the translator that this was a snake of the rocky highlands. The name Cantil actually originates from "kon-tliil" meaning 'yellow-lips', the extremely apt name applied by the Tzeltal Indians of Chiapas state, southern Mexico (Conant, 1982). Cantil was recorded as the Tehuantepecan common name for *Ancistrodon bilineatus* by Günther (1895, p.186) and it began to find wider favour once it had subsequently appeared in the various publications of Ditmars (1910 & 1931).

The correct pronunciation of cantil is 'con-teel' (Gloyd & Conant, 1990). Four subspecies are recognised (Campbell & Lamar, 1989). *Agkistrodon b. bilineatus*, the cantil, occurs along the entire Pacific coast of western Mexico from southern Sonora to Chiapas, including the Rio Grijalva valley in central Chiapas and Isla María Madre in the Islas Tres Marias, and the Pacific coasts of Guatemala and El Salvador. This range is continued down the Pacific coasts of Honduras, Nicaragua and Costa Rica, including Isla de Zacate Grande in the Honduran Gulf of Fonseca, by the most recently described subspecies *A. b. howardgloydi*, the castellana. On the eastern, Caribbean side of the Central American isthmus, *A. b. russeolus*, the Yucatecan cantil is found in the three Mexican Yucatán peninsular states of Campeche, Yucatán and Quintana Roo, and also in northern Belize (Lee 1996).

The fourth subspecies is the one of interest here. *Agkistrodon b. taylori*, Taylor's ornate cantil, exhibits possibly the most isolated distribution of any of the cantil races since it occurs in north-eastern Mexico, almost entirely within the borders of Tamaulipas state, from the Caribbean coast to the Sierra Madres, although the range does infringe slightly into the neighbouring states of San Luis Potosí and Nuevo León. (It is possible that further, as yet undescribed, subspecies may exist since there are areas of suitable dry forest habitat in central Honduras and Vera Cruz and Tabasco states of Mexico from which no specimens as yet have been recorded.)

The Mexican cantil, *Agkistrodon bilineatus bilineatus*, was successfully bred at West Midland Safari Park in 1989, 1991 and 1992 from a trio (2.1) of aged specimens obtained from Dudley Zoo (who had also bred them in the 1980's). Although the old adult Mexican cantils are now deceased two individuals from those couplings, both males, are still in the WMSP collection and two are in the collection of the Liverpool School of Tropical Medicine.

To the best of our knowledge Taylor's cantil, *A. b. taylori*, has not been bred previously in the UK although they have been bred in several US zoos including Gladys Porter, Texas; Columbus, Ohio and Detroit, Michigan.

### Maintenance at West Midland Safari Park.

Adults of Taylor's ornate cantil demonstrate a marked sexual dichromatism with females exhibiting an attractive pattern of alternating irregular light and dark grey saddles, the former being infused with bright yellow. The darker grey saddles are edged with black and the light grey saddles with white. The tail tip is yellow in juveniles and white in adults in common with the typical race. Juveniles use their tails for caudal luring of prey whilst adults thrash their tails about as part of a warning threat display. Males are much darker, being virtually black with the positions of the obscured lighter saddles being marked only by a 'V' of white and yellow scales. The heads are marked as typical cantils with five white stripes running back from the rostral scale, one down each canthus rostralis and over the eye, one down each upper jaw along the supralabials to the angle of the jaw, and the fifth down the centre of the chin to the throat. The supralabial scales of both are yellow - the yellow-lips of the Tzeltal Indian name, and this pigment extends under the chin, at least in the female. (Mexican cantils on the other hand shows no obvious sexual dichromatism.)

Two sub-adult female Taylor's cantils were obtained from the estate of the late Dave Lester in 1994. They were initially placed on show in an exhibit containing the three adult Mexican cantils and several of their offspring. Soon afterwards, during the night, one of the adult male Mexican cantils ate one of the female Taylor's cantils so the other female was removed. When the ageing Mexican cantils were relocated off-show in late 1994 the surviving Taylor's cantil was returned to the exhibit containing two subadult male Mexican cantils and a tropical rattlesnake (*Crotalus durissus cumanensis*).

A male Taylor's cantil arrived at WMSP in 1995 from a confiscation in the North of England. It was somewhat heavier in build than our female and after a period of quarantine it too was introduced to the Neotropical pitviper exhibit. Both the Taylor's cantils continued to feed well throughout the winter of 1995/1996.

### Breeding at West Midland Safari Park

Courtship and copulation were observed between the male and the female on 10<sup>th</sup> April 1996. Burchfield (1982) reports that copulation often occurred following ecdysis (sloughing) by the female when the males became sexually excited and in this instance the female had sloughed only hours earlier. (The female that was unfortunately eaten by the larger male Mexican cantil had sloughed the same day.) The pair were left together and they continued to feed. We had experienced no problems with our old female Mexican cantil being left on show and allowing her to give birth in the exhibit cage. However, on 19<sup>th</sup> August the female Taylor's cantil gave birth prematurely, to two dead and incompletely formed embryos and one infertile mass. We considered that being a younger animal than the old Mexican cantil she may have been disturbed by the public so next time we determined to remove the female to the Q Room for the full term of her pregnancy.

On 14<sup>th</sup> March 1997 the pair were again observed in copulation and a couple of weeks later, when all courtship behaviour had terminated, the female was removed to a quiet cage in the Q Room at 79-85° F. She rapidly increased in weight due to the developing embryos and surprisingly showed continual interest in food. On the night of 9<sup>th</sup> September, 199 days after the observed copulation, the female gave birth to nine neonates and no infertile masses. This seems to be an upper average number since litters in US zoos seem to vary from seven to nine. Our previous Mexican cantil litters numbered from seven down to three in the female's last year. All appeared healthy and alert and all exhibited the livery of their mother. Unlike Aruba Island rattlesnakes which, even at an early age, can be sexed by the relative length of the tail (O'Shea, 1997), the tails of cantils appear to vary little in length between males and females and no significant difference in relative tail length could be discerned even in the adult pair.

Burchfield (1982) provides details of finite differences in the patterning of neonates stating that "rhombs of the males tend to form bands and to have less interstitial patterning than those of females". In our litter there did not appear to be any discernible difference in patterning which would have enabled us to separate the sexes so it was necessary to resort to probing. The result was a ratio of 8:1. The SVL (snout to vent length) of the litter varied from 185-200 mm and the TL (tail length) from 40-45 mm.

Burchfield (1982) reports that captive copulations were observed at Gladys Porter Zoo from November to February with parturition from June to October with the period from copulation to parturition for one female being 163 days. Our female seems to have undergone a much more prolonged gestation period unless a later, unobserved, copulation took place in the 2-3 weeks before she was removed to the Q (quarantine) Room.

However, since ecdysis seems to be the trigger that stimulates the male into reproductive behaviour it is more probable that the observed mating was the one resulting in the birth of the neonates almost 200 days later.

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### Apology.

A review of Mark O'Shea's recent book 'A guide to the snakes of Papua New Guinea' was due to have appeared within the pages of your journal both in the September and then again the December editions.

Due to lack of space this review has not been included and for that we do apologise. The review will appear in the June 1998 edition of this journal.

Alan H. Wilkie Herptile Editor.



Plate No. 6 Taylor's Ornate Cantil *Agkistrodon bilineatus taylori*.  
(adult male (note:sexual dichromatism) Photo by Mark O'Shea.



Plate No.7 Taylor's Ornate Cantil *Agkistrodon bilineatus taylori*  
( '97 neonate) Photo Mark O'Shea.