

CAPTIVE REPRODUCTION IN THE EASTERN FOUR-LINED SNAKE, *ELAPHE QUATUORLINEATA SAUROMATES*

By: Kevin J. Hingley. 22. Busheyfields Road, Dudley. West Midlands, DY1 2LP, England.

Contents: Introduction, Breeding trials, Oviposition and incubation of the eggs, The young, Summary, Reference.

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INTRODUCTION

In July of 1993 I was given the opportunity to look after five specimens of *ElapHe* from the Greek island of Amorgos in the Cyclades, which had been captured in April 1993 by an English herpetologist, Mr. Richard Clark who lives in Norway. They remained with Achilles Dimitropoulos in Athens until July. The ratsnakes from this island have for many years been at the centre of a great deal of debate regarding their exact status, and this issue concerns two forms; one a patternless to only faintly patterned ratsnake (when adult) which was originally called *Elaphe rechingeri* (Werner, 1932), and the other which is more obviously some form of *Elaphe quatuorlineata*. This particular issue is a complex one though, and it will require a separate article to this one to be able to explain it, but to help me in my research with regards to the Amorgos ratsnake problem I decided to obtain specimens of two other *Elaphe quatuorlineata* subspecies, and where better than in Utrecht at the annual Snake Day event?

At the Snake Day in October 1993 I bought 2.2 captive bred babies of *Elaphe quatuorlineata quatuorlineata*, the Western Four-lined snake, and 2.2 adults of *Elaphe quatuorlineata sauromates*, the Eastern Four-lined snake. I also bought captive bred babies of *Elaphe climacophora*, *Elaphe flavirufa pardalina*, *Elaphe scalaris* and *Elaphe taeniura friesei* for myself and for friends in England who could not travel to Holland for this event. Later in the day I sold one of the adult pair of *Elaphe quatuorlineata sauromates* to an English friend who wanted some of these snakes. I also saw a very nice adult male on the tables occupied by Mr. Dmitri Tkachev of the Bion Terrarium Center (Kiev. Ukraine), which had reputedly originated from Kazakhstan, but by the time I had persuaded myself to buy this snake it had already been sold to someone else.

The four snakes of this subspecies that I had purchased earlier that day were a mixture of long term wild caught and captive bred specimens reputedly of Turkish origin, and they all appeared to be very healthy. I kept the largest pair for myself before agreeing to sell the smaller pair. I was content to have one pair which I could attempt to breed from and possibly help me in my studies of the Amorgos ratsnakes of uncertain status. About a month after returning to England I discovered the attractive Kazakhstan male snake on sale in a reptile dealer's shop, and along with a female I purchased him.

It was late in the year at that stage and so these and my other snakes were placed into hibernation. This is achieved in my snake room by turning down the room heater gradually over a period of two weeks until the temperature falls to 10°C, and then the thermostatic control of the room heater maintains this temperature for as long as external

temperatures remain low enough. Typically, hibernation proper in my snake room lasts for three to four months. Only the room is heated, the terraria within it have no additional heating or lighting source. A natural photoperiod is achieved by way of a large skylight window in the roof of this building. Once external temperatures begin to rise sufficiently to make it economical to completely heat the room to normal operating temperatures of 22°C to 30°C the cycle is reversed by gradually increasing the heater control, again over a two week period.

By the end of February 1994 the female *Elaphe quatuorlineata sauromates* purchased with the male from Kazakhstan was showing considerable and rapid weight loss, so I decided to warm only the four *Elaphe quatuorlineata sauromates* by placing them in separate fauna boxes and placing them on a heated shelf system which I normally use for egg incubation first, and then rearing of the young afterwards. This shelf system normally contains four shelves and a 6 metre long (75 watt) heat cable runs along each shelf in a single strand. By removing two of the shelves the cable can be doubled up on the remaining two shelves so that it provides sufficient heat (25°C) for adult snakes when the room is cold. The heat cable is controlled by a domestic dimmer switch and I can increase or decrease the heat output of the heat cable with this simple rheostat. The room and the remaining snakes in it were maintained at 10°C until the end of March 1994.

Within a week of warming these four snakes up the very thin female died before it could be established what was wrong with her. Fortunately the other three specimens resumed feeding and caused me no further concern. The pair which I had purchased at the Snake Day had enormous appetites and would accept between three and five adult mice each week. The Kazakhstan male did not have such an appetite, and all through the year he has proved that one or sometimes two adult mice are sufficient for him personally, despite his overall large size.

BRREDDING TRIALS

After several weeks none of the surviving three snakes showed any signs of entering a slough, so I decided to place one of the males in the female's fauna box (at this stage they remained on the heated shelf system) to see if they were ready to breed. At first I placed the 'Turkish' male in with the female and there was an immediate response - but I favoured the female breeding with the Kazakhstan male and so I removed the other male before he could copulate. The Kazakhstan male was not quite ready to breed and so I waited a week or so. When I introduced him to the female on 9/4/94 the pair copulated.

It was a very passive mating, very little 'twitching' or 'jerking' of their bodies and the male did not attempt to bite the female by the head or neck as sometimes occurs in *Elaphe* snakes. Once copulation had ended I removed the male and did not introduce him to the female for another week, and then on 16/4/94 they copulated again. I left them together in the female's container for several days and suspect that they mated again on the 17th of April. The next day I separated them and they were not placed together again after this date.

OVIPOSITION AND INCUBATION OF THE EGGS

I wanted to prepare the numerous 4 kg plastic containers I use for egg incubation and so these snakes were removed from the heated shelf system. The room was fully warm by this stage and so the two males remained in fauna boxes placed on top of my standard

wooden terraria, and the female was placed in one of the wooden terraria. She continued to feed, as did the two males and the other snakes I keep, and in early May she entered a slough. This was completed on 11/5/94 and she fed on two adult mice later that day. This was the last time she was offered food until the eggs were laid.

By 11/5/94 it was obvious she was gravid and so I placed a large plastic box in her cage half filled with damp sphagnum moss. This container had to be replaced with a deep plastic aquarium later on because she continually displaced the moss from the first container which was not as deep. On the 18th and 19th of May she became very restless and it was obvious to me that she would lay her eggs soon. On 20/5/94, 42 days after the first mating, she laid ten large eggs (measuring between 60 and 70 mm in length and 30 mm wide).

The eggs were removed to a 4 kg plastic container half filled with damp peat and kept at 28°C. After 30 days of incubation three of the eggs developed deep indentations, suggesting that they may have been ready to hatch, but all of the eggs continued to incubate and hatched between 29/6/94 and 1/7/94, 41 to 43 days after they were laid.

THE YOUNG

The ten offspring were of roughly equal length (around 35 cm) and very plump in girth. They were each transferred to 2 kg plastic containers on a substrate of paper towelling and given a small dish of water and a cardboard tube for security. They were kept at room temperature, which at that time of year was 28°C in my snake room, and not on the shelf system because this was still being used for the incubation of other species of snake eggs. After one week they sloughed for the first time and nine of them fed on pink mice. A few days later all ten fed and they continued to feed whenever food was offered to them after that. Their sex was determined by probing and revealed five males and five females - a perfect ratio.

At hatching these snakes were mid-grey with black head and dorsal markings, but after the first slough they became a lighter (silver) grey with dark chocolate brown markings. After a month or so the reddish-brown ventral coloration became more yellow, and although all of these snakes have since been sold I remain in contact with some of their new keepers and they appear to be growing very well. The ground colour is changing from silver-grey to yellow now that they are approaching 8 months old according to one keeper.

It will be interesting to see what they look like when they are finally fully mature because the male and female parents are quite contrasting (see photos). The Kazakhstan male is exceptionally yellow with a black spot on each scale which gives him a speckled appearance. The 'Turkish' female is more typical of this subspecies and has very little yellow ground colour owing to the large size of the blue-black dorsal and dorso-lateral blotches. Compared to some specimens, which can become very dark and obscurely patterned with age, she is attractively marked. The male has a completely yellow belly whereas the female has a yellow belly with heavy black markings on her venter (broken lines running from her neck to her tail made up of small streaks).

REFERENCE

- Werner, F., 1932. Eine neue Schlange aus dem Cycladen archipel. *Elaphe rechingeri* sp.n.. *Anzeiger der Akademie der Wissenschaften Wien* 99, 232.

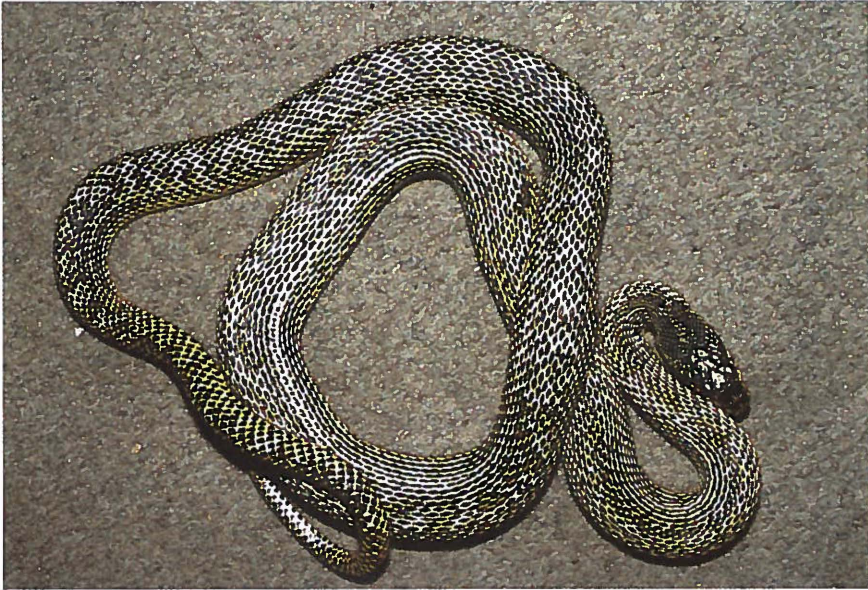


Foto 1: *Elaphe quatuorlineata sauromates*. Man uit Kazachstan.
Male from Kazakhstan. Foto: Kevin J. Hingley.



Foto 2: *Elaphe quatuorlineata sauromates*. Vrouw uit Turkeije.
Female from Turkey. Foto: Kevin J. Hingley.