

**THE SUCCESSFUL PROPAGATION OF
ELAPHE GUTTATA INTERMONTANA
(Woodbury & Woodbury 1942)
(= *E. G. EMORY*) -
THE INTERMOUNTAIN RATSNAKE,
IN CAPTIVITY**

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INTRODUCTION

The successful captive propagation of *Elaphe guttata* is indeed a common and rather uneventful occurrence in the hobby these days. A number of detailed studies over the years have documented the necessary conditions and parameters required to achieve positive results with this very popular and undemanding species (i.e. see Olsen 1987).

However, detailed articles relating to the subspecies *Elaphe guttata emoryi* - The Great Plains Ratsnake, are less common. This is possibly due to the fact that this rather drab subspecies may well lack some of the aesthetic appeal generated by its cousin the nominate form (*Elaphe guttata guttata*), in its many colour and pattern variations, most of which have been achieved by highly selective captive breeding programmes.

The disjunct population of *Elaphe guttata emoryi* known as *Elaphe guttata intermontana* found in East Utah and West Colorado has previously not been bred in Europe or its reproductive biology recorded, mainly due to the lack of available specimens. This article details the successful propagation of *Elaphe guttata intermontana* (= *Elaphe guttata emoryi*) involving true specimens taken from the isolated population.

The current taxonomic status of this population is currently under review and will be discussed in detail in two articles due to be published at the time of writing this paper - November 1993. (J. Weir, 1993 and H Smith et al. to be published).

The breeding stock to which this article relates were taken near Eckert, Delta County, Colorado, and all three specimens (2,1) fully agree with the differentiating characters as outlined by Woodbury and Woodbury 1942. i.e. smaller specimen size, reduced ventral scale count and an increased dorsal body blotch count.

Personally I remain totally unconvinced by Dowling's (1952) synonymy of the taxon *Elaphe guttata intermontana* under *Elaphe guttata emoryi*.

BRIEF NATURAL HISTORY NOTES

Valentine (pers. comm.) describes the area around Eckert as desert, although vegetation is found in and around river valleys. My own specimens were caught in such habitat. Running

water is found all year round and the hot summers are frequently interrupted by heavy thunderstorms. The annual precipitation is around 18 cm, including winter snow. The Grand Mesa north of Eckert receives heavy snowfall during winter. The coldest recorded temperature in recent years for this area is -30°C and the highest 39°C. Valentine also states that '*emoryi*' are fairly common in the area around Eckert.

REPRODUCTIVE BIOLOGY

Initially the specimens collected (N=10) were housed in small groups and a number exported to Europe, where they were subjected to captive conditions applicable to other North American temperate ratsnakes (i.e. *Elaphe guttata guttata*). In the adopted regime a period of winter cooling was included, but successful reproductive results were not achieved.

I received a trio (2,1) of the original stock into my facility in October 1992. They were housed individually in small drawer type vivaria, not fed and kept warm until the end of October. They were gradually cooled over a two week period until a temperature of 10°C was achieved, the photoperiod was also reduced and eventually the lighting was switched off. They were kept in this state until the end of February 1993. During the period of winter cooling fluctuations in temperature were recorded, 10°-15°C. At the higher temperatures increased activity was noted. At the end of February the vivaria were gradually warmed to 26°C and the photoperiod was increased to 14 hours. All three specimens began feeding well on pre-killed (small) adult laboratory mice offered on forceps. Both males sloughed on 16-3-93 and the female on 20-3-93.

On 22-3-93 the two males were placed together in a larger vivarium and the female was introduced to the males next day. Copulation took place immediately and involved the larger male (M1) and lasted from 18.50 until 19.35 (see Photo 1). M1 became extremely dominant over the next few days and M2 was noted to behave in a very subordinate manner. Another copulation was observed next day at 16.35 and again involved M1. On 25-3-93 M1 was observed chasing M2 around the vivarium, biting M2 in the midbody region - no injuries resulted (this was repeated on several occasions). However, on 26-3-93 at 18.05 M2 was observed in successful copulation with the female, on 28-3-93 both males were observed simultaneously trying to mate with the female although neither appeared successful.

By 1-4-93 it was already obvious that the female was gravid and thus she was removed to a large plastic box to allow egg development to take place unhindered. Combat between the males ceased immediately.

The pre-oviposition slough began on 6-4-93 and was completed without any problems on 14-4-93. On 16-4-93 a small plastic box containing sphagnum moss was introduced and the water bowl was removed. Both males continued to feed during the breeding period and the female's last feed before egg-laying was on 31-3-93. At 07.30 on 21-4-93 the female was found in the laying box having laid 3 eggs, a further inspection at 15.30 revealed another 3 eggs and egg laying was clearly completed. The eggs were removed and placed in damp vermiculite (1:1 with water by weight) and incubated at 28+/-1°C.

The clutch was small as one would expect from a small colubrid snake, although egg sizes were similar to *Elaphe guttata emoryi* taken from the main population, specimens of which are usually much larger than those from the disjunct population. All six eggs appeared fertile and during incubation they were inspected each week.

The gestation period for *Elaphe guttata intermontana* when kept at an average temperature of 26°C is therefore 29 days if one assumes the first copulation successful. The female fed 3 hours after laying and sloughed on 30-4-93. Due to her excellent condition



Foto 1: *Elaphe guttata intermontana*, paring. Mating.
Foto: John Weir.



Foto 2: *Elaphe guttata intermontana*, jong van een paar uur oud.
Hatchling, a few hours old.
Foto: John Weir.

she was re-introduced to the males in an attempt to achieve a further clutch, however no further mating activity was noted or achieved during 1993.

Hatching began on 14-6-93 when one egg was noted split at 16.00, by 07.30 the next day the first hatchling had fully emerged (see Photo 2). A further 3 hatched on 17-6-93 and the last 2 on 18-6-93, this data gives an incubation period of 55 - 58 days at a temperature of 28+/-1°C. The hatch rate was 100% and the hatchlings readily accepted pre-killed pink mice after their first slough.

GENERAL DISCUSSION

It is generally accepted that *Elaphe guttata emoryi* produce a smaller number of eggs per clutch than the nominate form *Elaphe guttata guttata* and that the hatchlings are usually larger in size and easier in most cases to 'get started' on nestling mice (see McEachern 1991). Clutch size in *Elaphe guttata emoryi* is highly variable, 10 eggs (Reid 1983), 15 (Werler 1951), 14 (Perkins 1943) and 4-5 (Clark 1953), thus mature adult specimens of *Elaphe guttata emoryi* have a recorded clutch size of between 4 and 15 eggs.

Reid (1983) gives 18.71 g as the hatchling weight from a sample of seven. The average weight from the clutch of six *Elaphe guttata intermontana* hatchlings described in this article was 8.33 g. Riley (pers. comm) gave details of a clutch of 13 *Elaphe guttata emoryi* eggs hatching after 53 days at 28°C, interestingly these hatchlings generally appeared smaller when compared to those of *Elaphe guttata intermontana*. (I expected the reverse).

The two main parameters for successful captive reproduction in this subspecies appear to be:

- a: a period of at least 3 months Winter cooling at a temperature of about 10°C. Wright & Wright (1957) give a period of activity from early May to late August. Some individuals found at higher elevations may spend up to 6 months in hibernation.
- b: the isolation of the sexes during the cooling period.

Otherwise the husbandry techniques involved mirror those employed for the successful propagation of the commonly kept *Elaphe guttata guttata*.

I feel it is also important that specimens from the '*intermontana*' population are NOT interbred with specimens originating from the main range in order to preserve the unique genetic integrity of this population.

They make ideal vivarium subjects due to their small size, placid disposition and undemanding requirements. Their reproductive biology is straightforward and a reasonably large colony can be catered for in a small vivarium, providing adequate isolation areas are available for female specimens during egg production.

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