

Captive propagation of the Mandarin Rat Snake (*Elaphe mandarina*) at Moscow Zoo

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Abstract. -Some results of a long-term breeding project aimed at captive propagation of the Mandarin Rat Snake (*Elaphe mandarina*) are presented. Data on breeding periods, clutch size, number of young and their sizes are given.

Key words: *Reptilia*, *Serpentes*, *Elaphe mandarina*, captive reproduction.

Introduction

The Mandarin Rat Snake (*Elaphe mandarina*) is distributed in south-eastern Asia from upper Burma (Myanmar) through southern China to northern Vietnam, inhabiting mountain forests and rocky slopes covered with bushes. It probably is one of the most sought after species of the genus, for a large part due to its unusual and quite colorful coloration. However, these snakes are rather difficult to maintain, as most of those becoming available are wild-caught and usually arrive very stressed and in a poor shape after prolonged transportation and transfers. Also, one of the main reasons for a low percent of success when trying to adapt a newly received wild-caught Mandarin Rat Snake is a nearly obligatory and quite heavy parasite infestation, including both subcutaneous and internal helminths. From more than a dozen of wild-caught Mandarin Rat Snakes, that have been in our possession in course of about 10 years, only three survived and adapted to captivity, mainly because of prompt and extensive medical treatment of the above mentioned problems. Lately, as a routine, we treat all newly arrived snakes with Metronidasol (Flagyl) 250 mg/kg, repeated after 10 days; 2.5% Albendasol (Valbasen) 0.2-0.4 ml/kg, repeated twice every 7 days if symptoms persist; Prasiquantel (Baytril) 5mg/kg every 24 hours for 3-5 days, administered either per os or subcutaneous, depending on clinical signs. Another traditional mistake made when dealing with this species is over-heating which also can (and usually does) cause health problems. Thus, probably the largest chances for success are with either captive-born or very young wild-caught animals, provided the general care is correct.

Husbandry and Reproduction

In 1989, a pair of new-born Mandarin Rat Snakes was received from probably the first breeder of this spe-

cies, Mr. Munzenmaier. The animals were 290+65 mm and 330+68 mm long (body length + tail length, male and female, respectively) and weighed 13.3 and 13.9 g. They were housed together in a glass enclosure, measuring 40 x 25 x 25 cm (L x W x H) with typical assortment of water basin, several shelters, moisture chamber (which they frequented eagerly), etc. An incandescent heating bulb was present in the terrarium, however, for the most part it was switched off, as the preferred temperatures for these snakes apparently were 22-26°C during daytime and 16-18°C at night (both according to previous owner's and to our own observations). Humidity was maintained at a rather high level, by daily sprinkling with warm water. Rations included pink mice and, eventually, adult mice and small rats (even as adult, the male prefers pink mice to any other food), offered at first twice a week and then, as the snakes grew, weekly. Chicken and frogs were offered as well, but without any success. The snakes grew fast and eventually were housed separately, in glass enclosures 60 x 40 x 40 cm.

By October, 1992, the snakes measured 734+175 and 742+154 mm and weighed 231.8 and 327.7 g (male and female, respectively) and were considered mature. After a preparatory period of 30 days they were put to hibernation at 11-14°C for approximately 3 months. After hibernation, in February-March, the snakes were housed separately and were offered food more often than prior to hibernation, i.e. twice a week. No vitamins were added and no UV radiation was present.

On 1 April, 1993, the female was introduced to the male's enclosure, with male showing immediate interest and beginning to purchase the female at once. Approximately two hours later, first copulation was observed, lasting for 28 minutes, during which period the male was holding the female by the "neck" with

Table 1. Egg measurements of clutch from 1993.

#	L max, mm	L min, mm	W*, g
1	51	24	
2	57	27	
3	50	23	(= 84.06)
4	50	24	
5	53	26	

*all eggs were glued together and no individual weights were taken.

Table 2. Measurements of the young.

Year	#	Lc, mm	Lcd, mm	W, g
1993	1	250	51	13.07
	2	220	45	8.66
	3	248	56	13.81
	4	235	54	12.60
1994	1	221	48	11.08
	2	215	46	11.58
	3	210	48	9.70
	4	192	46	5.89
	5	210	45	10.83
	6	208	45	9.92
1995	1	196	43	10.65
	2	235	52	13.30
	3	218	44	10.00
	4	220	44	12.34
	5	212	41	9.90
	6	192	38	9.54

his teeth. Several hours after they parted, the snakes were separated again. This routine continued for three weeks, with at least 5 copulation occurring (sometimes the snakes were left together for the night and no observations were made on their behavior).

By mid-May, 1993 the female looked obviously gravid and 5 eggs could be palpated. Starting from about that time, she refused food and in the morning of 5 June laid 5 large eggs (see Table 1). The eggs were placed in an incubator, at 25-28°C and very high humidity, with sphagnum moss for a substrate. Incubation period consisted continued for 48 days and the first egg hatched on 22 July, with the young emerging on the same day. Of 5 eggs 4 hatched, with the last young emerging on 24 July. Measurements of the young are presented at Table 2. For the first time they shed on 8-11th day and started to feed on pink mice soon after. There were no real problems with their feeding as all young were very aggressive and bit their preys at the slightest provocation, after which usually strangled and swallowed them. The same as their parents, young Mandarin Rat Snakes grew fast and by December they were about 1.5 times their hatching size.

Starting from 1993, the same pair of snakes produced three clutches from which more than 15 young hatched. The general incubating routine was more or less the same and most eggs hatched successfully, with typical sex ratio being 2:1 (males:females).

Conclusions

Basing upon our 6-year experience with Mandarin Rat Snakes, we consider this species not as difficult to maintain and to breed in captivity as the general public perception believes it to be, of course, provided the animals are either captive bred or, if they are wild-caught, are treated for parasites immediately upon arrival. Antibiotic prophylaxis is also very advisable. Temperature requirements are of vital importance as, if overheated, these snakes tend to become ill and die rather fast. It also should be noted that Mandarin Rat Snakes are easily stressed and for successful husbandry they should be provided with enough shelters and better are kept separately.

Literature Cited

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