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## KEEPING AND BREEDING OF ANDEAN MILK SNAKE (*LAMPROPELTIS TRIANGULUM ANDESIANA*)

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### Abstract

The popularity of Andean milk snakes among reptile enthusiasts has grown a great deal in recent times. Presently, there is a huge array of subspecies of the *Lampropeltis triangulum* species which are bred and kept in captivity. The most common subspecies include *L. t. sinaolae*, *L. t. campbelli* and a representative of the giant subspecies, the Honduran milksnake (*L. t. hondurensis*) (Mara, 1994; Gál, 2002). The Andean milksnake (*L. t. andesiana*) is another significant representative of the giant subspecies of milksnakes next to *L. t. hondurensis*, *L. t. gaigae*, *L. t. abnormalis* and *L. t. micropholis* (Thissen & Hansen, 1996).

**Keywords:** Andean milksnake, keeping, striped form

### Összefoglalás

A királysiklók tartása a hobbi hüllőtartók körében nagy népszerűségnek örvend. Számtalan fajt és a *Lampropeltis triangulum* több alfaját gondozzák és tenyésztik terráriumokban, melyek közül a leggyakoribb a *L. t. sinaolae*, a *L. t. campbelli* és a nagytermetű alfajok egyik képviselője, a honduraszi királysikló (*L. t. hondurensis*) (Mara, 1994; Gál, 2002). A nagyméretű *triangulum* alfajok egyike (a *L. t. hondurensis*, a *L. t. gaigae*, a *L. t. abnormalis* és a *L. t. micropholis*) mellett az andoki királysikló (*L. t. andesiana*) (Thissen & Hansen, 1996.) Jelen közleményben áttekintést adunk az alfaj tartásáról és tenyésztéséről, illetve beszámolunk egy hosszant csíkos színmutáció hazai megjelenéséről.

**Kulcsszavak:** andesi királysikló, tartás, csíkos változat



## Taxonomy of the Andean milksnake

Class: Reptilia

Order: Squamata

Suborder: Serpentes

Family: Colubridae

Genus: *Lampropeltis*

Species: *Lampropeltis triangulum*

Subspecies: *L. t. andesiana*

## Occurrence

The Andean milksnake's geographic distribution is found to be in the tropics of South America, the Andes mountain range the side facing towards Columbia. The giant subspecies, is one of the most southerly distributed subspecies of milksnakes (Cherry, 1997). According to Thissen & Hansen (1996) *L. t. andesiana*'s distribution is found neighbouring to that of subspecies' *L. t. micropholis*. Navarette & Rodríguez-Acosta (2003) in detail, has described where Andean milksnakes may be found. The subspecies of milksnake occurs specifically, next to Columbia in the provinces of western Venezuela, Tachira, Merisa and Zulia.

## Habitat

The Andean milksnake's habitat range is widespread. It consists of areas high in altitude including mountain ranges. The altitude ranges between 250-2700 m above sea level. The habitat is diverse. It includes forests and their surrounding areas, consisting of both scant and densely wooded areas. Despite being in the tropics, these areas being mountainous may experience low temperatures (Thissen & Hansen, 1996; Cherry, 1997). Navarette & Rodríguez-Acosta (2003) studied specimens kept in museum collections after being obtained from habitats 1500-2150 m above sea level. The snakes were found to live primarily in rock crevices, under fallen tree remnants such as bark and, occasionally hiding under decaying organic matter (Cherry, 1997).



## Description and definition

The Andean milksnake as mentioned previously, is a large bodied, robust subspecies of *L. triangulum*. According to *Thissen & Hansen (1996)*, adult milksnakes reach a maximum body length of 145 cm while their offspring's body length ranges between 20-25 cm in length. *Cherry (1997)* reports adult milksnakes to range in length between 96-152 cm. *Navarette & Rodríguez-Acosta (2003)* found that among their 8 specimens, from their museum collection, females even as short as 87 cm in length were able to produce viable eggs.

The Andean milksnake, a *triangulum* subspecies with its large robust body, can be said to be most similar to the Florida Kingsnake (*Lampropeltis getulus floridana*). The patterns found typically on this subspecies, as in other *triangulum* subspecies, consist of red-black-white-black-red rings (*Figure 1*) Similarly to other subspecies from this group, the Andean milksnake also experiences gradual darkening in color with each consecutive shedding. The phenomenon is due to an increase in melanin (*Figure 2*) The change of color is especially significant in the case of *L. t. gaigae* where juveniles have the characteristic ring pattern, while adults are completely black in coloration (*Markel, 1990*) (*Figure 3*).



**Figure 1. Regular ringed male**

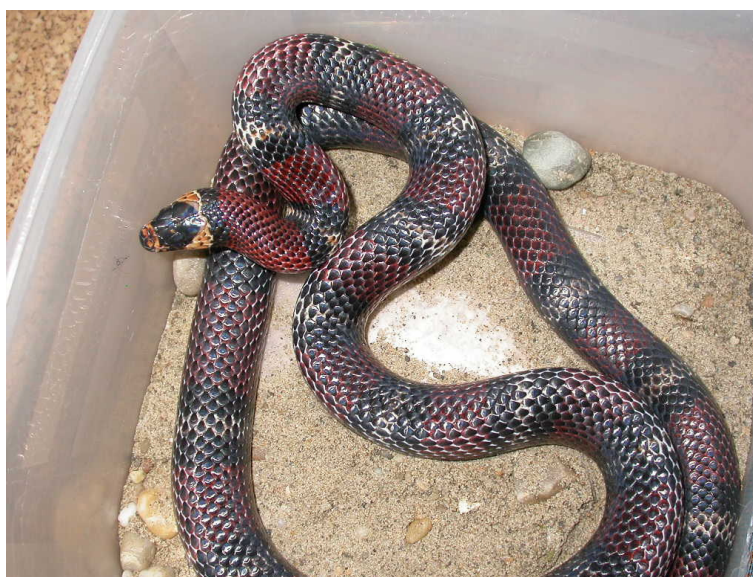
*1. ábra: Szabályosan gyűrűzött hím*





**Figure 2. Breeding female with rich melanosis of her scales in the process of shedding**

2. ábra: Vedlés előtt álló, erősen melanóvizist mutató tenyésznőstény



**Figure 3. 3-month-old *L. t. gaigae***

3. ábra: 3 hónapos *L. t. gaigae*

Navarette & Rodríguez-Acosta (2003) provides data which gives a clear description of the Andean milksnake (Table 1).



**Table 1. Description of *L. t. andesiana* based ring patterns and scales**

Number of Rings			Number of Scales				
Black	White	Red	Abdominal shields (plate)	Subcaudal shields	Supralabial shields	Infralabial shields	Dorsal scales
61,9 (52-69)	31,1 (26-35)	31,1 (26-35)	221,3 (214-217)	47,6 (44-50)	7 (71,4%) 8 (28,6%)	8 (28,6%) 9 (71,4%)	19-17 (28,6%) 21-17 (71,4%)

The Andean milksnake's head is characterised by a white shield around the nasal area with a distinct black border. The shields found on the top of the head are larger and black in coloration (*Figure 4*). Rings running the length of the body extend to the abdomen, on to the abdominal shields where they form their closure. In some cases, some rings do not completely reach the abdominal region (*Cherry, 1997*). The red and white scales are always tipped or bordered with black in this subspecies (*Figure 5*). *Navarette & Rodríguez-Acosta* (2003) examined the scales in detail and found that the black rings are constructed of 2-5 (2.9) scales in width, the white rings 2-4 (2.4) scales in width and the red rings 2-8 (3.3) scales in width.



**Figure 4. Head of *L. t. andesiana***

4. ábra: *L. t. andesiana* feje

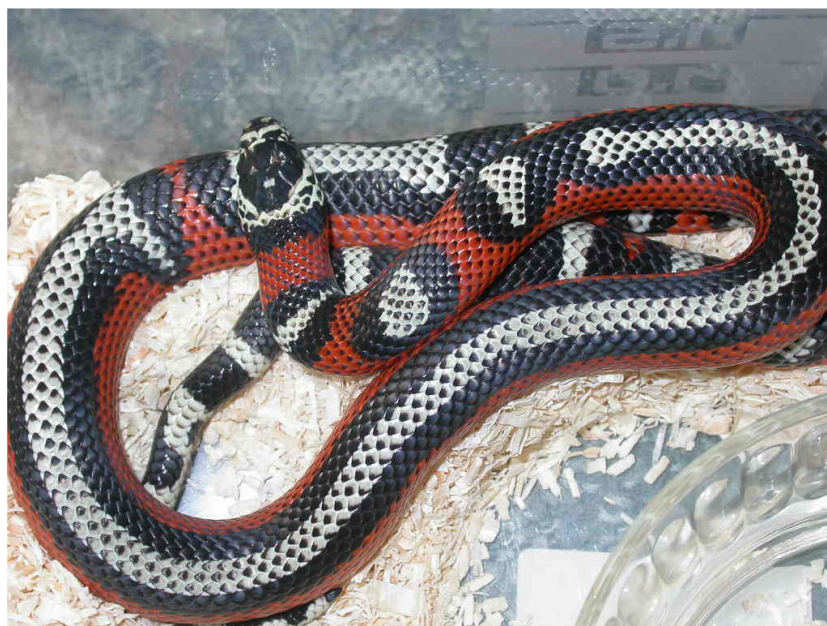


**Figure 5. Rings found on the central part of the body. The scales have black tips**

5. ábra: A test középső részén található gyűrűk. A pikkelyek feketén jelzettek.

The literature reviewed that describes this subspecies' ring patterns is consistent with these findings. In our own collections on the other hand, year after year some females produce offspring with partially ringed patterns and in some cases, fully striped offspring have occurred besides the normally found ring patterns. The striped juveniles have two black lines separated with white which run the length of their bodies (Figure 6 and 7). These specimens have heads with the same color as their normal ring-patterned counterparts, while the rest of their bodies are unique in that, they are covered with scales red in color. The red color also extends on to the abdominal region and the red scales are bordered with black. The black and white scales which make up the stripes on these specimen's backs are 2-3 scales in width. Until this time, four such black and white striped specimens have survived from the breeding pair which produced the striped individuals in the first place (Table 2 and Figure 8).





**Figure 6. 1 month old, length-wise striped Andean milksnake**

6. ábra: 1 hónapos, hosszanti csíkozottságú andoki királlysikló



**Figure 7. 1-year-old, length-wise striped Andean milksnake**

7. ábra: 1 éves, hosszanti csíkozottságú andoki királlysikló

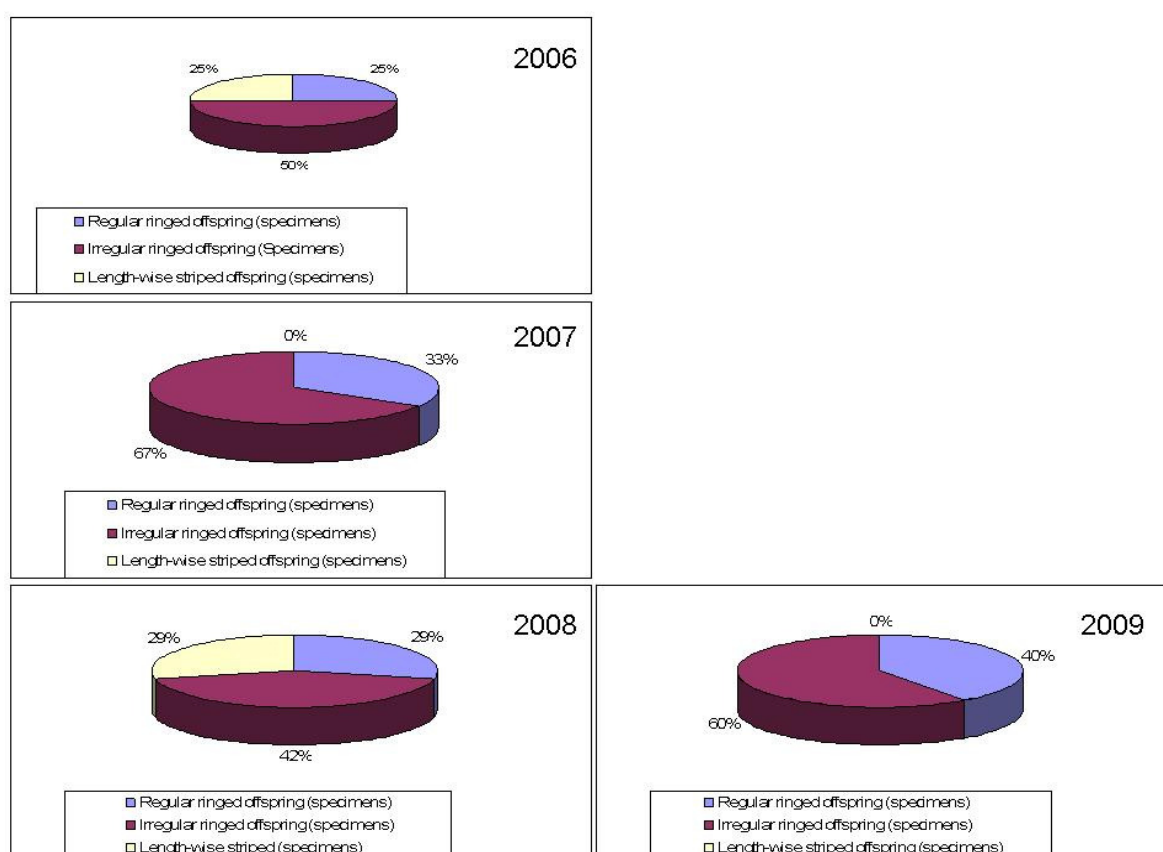




**Table 2. The length-wise striped, the regular and the irregular-ringed offspring numerical distribution produced each year**

Breeding year	Number of eggs laid	Loss during the incubation period	Distribution of hatched eggs		
			Regular-ringed offspring (specimens)	Irregular-ringed offspring (specimens)	Length-wise striped (specimens)
2006	6	2	1	2	1
2007	5	2	1	2	0
2008	7	0	2	2	3
2009	7	2	2	3	0

During the growth of the length-wise striped offspring, a gradual darkening of scales may be observed but, not to the extent as in the subspecies, *L. t. gaigae*. In addition, it should be noted that irregular-ringed offspring and partially striped offspring have also been observed to hatch in certain nests (Figure 9 and 10).



**Figure 8. Length-wise striped, regular and irregular ringed offspring distribution percentage-wise in each year**

8. ábra: Hosszant csíkos, szabálytalan és szabályosan gyűrűzött utódok előfordulása egyes években



**Figure 9. Partially (anterior) striped snake**

9. ábra: A test elülső részére terjedő részleges csíkozottság példány



**Figure 10. Irregular-ringed specimen**

10. ábra: Szabálytalanul gyűrűzött példány



## Behaviour

Juveniles in response to movements of keepers, even when prey is being offered, will respond with violent, thrashing, and defensive movements. As the snake will lash out to grab its prey, it will hiss with loud exhalations. Unfortunately, these behavioural characteristics may remain even in certain adult snakes. These individuals will quickly slither away to the hiding spots in their terrariums. In cases where danger is sensed, it is not uncommon for such individuals to also shake their tails threateningly. During handling, biting and releasing of fluids from scent glands also as a defensive behaviour, may occur.

Capturing prey is also characterised by pugnacious behaviour. When prey is offered and the snake is actually hungry, it will rapidly grasp and wrap itself around its prey (*Figure 11*). Snakes kept in groups in such situations, may wrap around each other.

## Keeping

The Andean milksnake is commonly kept snake. The subspecies was first reported to be successfully bred in captivity in 1989 in a zoo according to the literature (*Hammack, 1989*). Considering the body size of the Andean milksnake and its characteristically stressful behaviour, most literature recommends keeping these snakes in terrariums. Based on our experiences this subspecies is relatively tolerant of „technological factors”, used in its care, which means even without a specific „biotope” terrarium, these snakes can be kept in a satisfactory manner and will successfully breed and produce viable offspring. To start with our snakes were kept individually in 30 x 30 x 50 cm sized, infrared light equipped terrariums with adequate hiding places, consisting of red-pine woodchips. At present, our snakes are kept under hygienic conditions in easy-to-clean breeding boxes. The adults are kept in their own cages, 30 x 60 cm in area with a cage height of 18 cm. The snakes are kept on good quality wood shavings without any specific hiding places provided. Juveniles are kept in an area of 20 x 35 cm and a height of 14 cm. Newly-hatched snakes after hatching are placed in plastic containers with an area of 12 x 20 cm and 8 cm in height (*Figure 12*). The containers are pierced on three sides to ensure adequate ventilation. The snakes receive fresh water and are provided with a potential bathing area by means of a full water dish.





**Figure 11. Juvenile Andean milksnake in the process of strangling its prey**

*11. ábra: Zsákmányát fojtó fiatal andoki királlysikló*

The Andean milksnake's natural habitat is generally cooler and of high humidity. For this reason, it was thought for a while, that these snakes should be kept in cooler temperatures while regularly spraying tap-water as many as 2-3 times a day into their environment. Based on our earlier observations over a two year period, we noticed that already at temperatures of 26-27 °C the snakes would eat only periodically (Gál, 2002). Information collected since then confirms that this subspecies tolerates this temperature range well and, that it may not be necessary to spray their environment with water that often. In our present collection, consisting of eight breeding snakes kept under these conditions of 25-26 °C, the snakes feed and reproduce successfully.

Despite being characterised as a snake highly prone to stress, the Andean milksnake tolerates well being kept under cage conditions. The snakes are moved and disturbed sometimes on a daily basis in order provide them with food and water, to eliminate faeces or for overall monitoring of their keeping conditions. The snakes seem to thrive despite these frequent disturbances.



**Figure 12. Box for rearing juvenile Andean milksnakes**

*12. ábra: Nevelő doboz, fiatal andoki királýsikló*

## Feeding

The natural diet of the Andean milksnake generally consists of prey animals such as rodents (Cherry, 1997). Navarette & Rodríguez-Acosta (2003) found small mammals in the stomachs of three snakes they examined. According to our own experience, this subspecies will readily accept mice and rats in various forms, including live or killed as well as previously frozen prey.

In order for the female and male to reproduce successfully and to establish a proper nest, they must be fed often with large portions. Our breeding females are fed once to twice a week 1-3 adult mice whereas the males are fed every 1-2 weeks with one adult mouse. It is recommended that the females be fed intensively, the week before and the week following breeding. They may be offered food every 2 days as during this is the time period the eggs will form the yolk (vitelline) material.



The newly hatched snakes may be rather prone to stress yet, they tend to start feeding without any problems. There may be on occasion individuals that take to eating only periodically (Gál, 2002). Cherry (1997) observed that both the adult and juvenile snakes eat very ravenously. It may be observed that the juveniles will eat so ravenously that they will engulf the newborn mice live.

## Breeding

The breeding of the Andean milksnake is dependent on the fact that these snakes hibernate. We allow the breeding snakes to hibernate by placing them in a dark environment at a temperature of 7-12 °C for a period of 2.5-3 months. This protocol is recommended by Hammack (1989). During hibernation the snakes are ensured adequate drinking water into which the snakes have been found to coil up. Following hibernation, the snakes are gradually returned to their original keeping conditions over a period of several weeks at which time, they will begin to feed again. After hibernation juvenile mice are fed to the adult snakes rather than adult mice so as not to overwhelm their digestive systems, which need time to fully regain their functions.

On average the snakes tend to shed 3-7 weeks following hibernation. It is ideal, at this time, to attempt to breed the snakes. It may occur that the snakes breed before shedding. In our experience, it is a good method to place the females in with the males. Very shortly he will begin to court the female.

Gravid females as mentioned previously, should be fed intensively, up to the time during which she will prepare to lay her eggs and physiological anorexia will set in. The start of this condition varies amongst females. In some cases, the female may still accept food even on the day that she begins to lay her eggs.

A female snake should have a laying box placed in her cage following the so called maturation shed, which occurs just before she lays her eggs. Cherry (1997) suggests placing wet moss mixed with vermiculite. We recommend placing wet peat in the box. When the female approaches the time of laying she will become restless, searching for the most suitable place for her eggs. She will finally coil up to lay her eggs when she is satisfied with the conditions. This tends to occur most commonly in the early hours of the morning.

The number of eggs laid into each nest tends to vary depending on the size of the female. Thissen & Hansen (1996) reports that nests tends to consist of 7-11 eggs. Navarette & Rodríguez-Acosta (2003) examined three gravid females, two of which they knew the exact body length. The 92 cm long female snake contained 6 eggs, the 87 cm female snake contained 8 eggs and, the third female snake contained 14 eggs.





The gravid females out of our breeding group had 5-7 eggs each on average, while the eggs were of a rather large size. In each of the nests the eggs sat tightly touching each other and, were impossible to separate.

Hatching the eggs will take place in the peat, at a temperature of 24-29 °C which usually requires 60-81 days. Upon hatching of the first snake, it is expected that the rest will follow at a maximum of 2.5 days. Cherry (1997) reported hatching to take 59-68 days, while Thissen & Hansen (1996) reported it to take 71-85 days. The newly-hatched snakes will complete their first shed 12-18 days following hatching. At this time, they should be offered mice as food. Under ideal conditions of feeding and keeping, according to our observations, it takes 3 years for the snakes to become mature breeding animals.

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