

**Milksnakes (*Lampropeltis triangulum*)
from Cochise County:
Notes on captive breeding and pattern.**

James A. Badman and Larry Neinaber
Animal Care Program, Arizona State University
Tempe, Arizona, 85287-0608 USA

Dale F. DeNardo and Andrew T. Holycross
Department of Biology, Arizona State University
Tempe, Arizona, 85287-1501 USA

To the best of our knowledge, a total of only four specimens of Milksnake (*Lampropeltis triangulum*) have been documented from below the Mogollon Rim in Arizona; including a voucher photograph deposited at the University of Arizona (UAZ 50283) and three specimens collected by A. T. Holycross. All four specimens were collected from a Tobosa (*Hilaria mutica*) grassland situated on the divide between the San Simon and San Bernardino Valleys, Cochise County. Of the specimens collected by Holycross, the first two, a male (originally reported in: Holycross and Schwalbe 1995) and female, were collected on 23 June 1994 and 13 July 1995 (respectively) and held in captivity in the Arizona State University Animal Care Facility. The final specimen, a male, was collected 9 August 1995 and released shortly thereafter.

The Milksnakes we captured differed in some aspects of pattern and scutulation. The male snake had seven right and left supralabials, 9 right and left infralabials, 190 ventrals, 21 dorsal scale rows at midbody, 30 white annuli on the dorsum (28 complete, 2 partial; with 27 of these annuli completely crossing the venter), and 28 red-orange saddles on the dorsum which just reach the lateral edges of the ventral scutes. Solid black markings separate the posterior 18 red-orange saddles ventrally. The anterior 10 red-orange saddles are separated ventrally by black markings interrupted by a mid-ventral white line. Ten of the red-orange saddles are bisected mid-dorsally by encroaching black borders. The top of the head is solid black from the tip of the snout to just anterior of the termination of the parietals. The ventral and dorsal pattern of the released male snake approximates the pattern described for the specimen above. The female snake had 8 right and left supralabials, 9 right and left infralabials, 191 ventrals, 21 dorsal scale rows at midbody, 22 white annuli on the dorsum (20 complete, 2 partial; with only the 2 most anterior annuli completely crossing the venter), and 20 red-orange saddles on the dorsum which just reach the lateral edges of the ventral scutes. The venter of this snake is uninterrupted black for the posterior 80% of its body length; white annuli of the dorsum terminate on the lateral aspects of the ventral scutes. None of the red-orange saddles are separated mid-dorsally by encroaching black borders. The top of the head is solid black from the tip of the snout to just anterior of the termination of the parietals. The nearly solid black venter of the female contrasts strongly with the ventral patterns of the two males examined. Female *L. triangulum* with most of the venter covered in black have been observed in Montana populations as

well (L. Vitt, pers. comm.). To further investigate the possibility of sexual dimorphism in ventral pattern in this population, we bred the male and female captives.

Beginning 28 December 2001 the pair was cooled for a period of two months (8 hours of 20 °C and 16 hours of 15 °C each day). The female shed her skin 13 May 2002. On 16 May, she oviposited six eggs with a total mass of 39.4 g. Five eggs totaled 34.0 g. While individual egg masses were not possible because the eggs were adhered to each other, the eggs appeared similar in size. One egg (with incomplete shell formation) was separate from the other five and weighed 5.4 g. The female's post-oviposition mass was 65 g, and therefore the relative clutch mass (RCM = clutch mass / female post-oviposition mass, Shine 1980) was 0.61, which approximates the mean reported for terrestrial oviparous snakes (Shine, 1992). Eggs were placed in moist perlite and incubated at 28-30 °C. The poorly-shelled egg spoiled during the first month of incubation and was discarded. On 29 June, two of the remaining five snakes were pipping. On 30 June, the first two snakes hatched and the remaining three were pipping. All had hatched by 1 July and all had shed by 10 July. Hatch weights were 5.8, 5.4, 5.1, 4.7, and 4.5 g. The sex ratio was 2.3, and no sexual dimorphism in belly pattern was observed. All five neonates appeared to have an aberrant dorsal pattern, possibly caused by high incubation temperatures.

Literature Cited

- Holycross, A. T., and C. R. Schwalbe. 1995. *Lampropeltis triangulum*. Geographic Distribution. *Herpetol. Rev.* 26:46
Shine, R. 1980. "Costs" of reproduction in reptiles. *Oecologia* 46:92-100.
Shine, R. 1992. Relative clutch mass in lizards and snakes: is reproductive investment constrained or optimized. *Evolution* 46:828-833.

