



# Unusual Clutch Size and New Prey Items for a Western Ribbonsnake, *Thamnophis proximus* (Say 1823), from Hidalgo, Mexico

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Western Ribbonsnakes (*Thamnophis proximus*) are large natricids (SVL to 900 mm) (Rossman et al. 1996) that range widely across the central United States, the Gulf Coast of Mexico, and south into Central America (Uetz et al. 2023). The species occupies a wide variety of mesic habitats such as grasslands, mangroves, and oak for-

ests, always associated with lakes, rivers, swamps, and artificial ponds (Rossman et al. 1996). Females in populations in the United States usually reach sexual maturity around 500 mm SVL (although they may be smaller), reproduce in annual cycles during springtime, and give birth in mid-summer/early autumn in the months of June to September



**Figure 1.** An adult female Western Ribbon Snake (*Thamnophis proximus*) (SVL 450 mm) with 12 embryos and stomach contents consisting of two Rio Grande Leopard Frog (*Lithobates berlandieri*) tadpoles. Photograph by Luis Fernando Hidalgo Licona.

with clutch sizes ranging from 8 to 12 (Rossman et al. 1996). Studies, also limited to the United States, have reported that the diet consists primarily of amphibians (Wendelken 1978; Lancaster and Ford 2003; Hampton 2013). Trophic ecology and clutch sizes of Mexican and Central American populations are largely unknown.

At about 1200 h on 20 July 2023, we collected an adult female *T. proximus* (SVL 450 mm, tail length 200 mm, weight 43 g; Fig. 1) in the Municipality of Tianguistengo, Hidalgo, Mexico (20.801893, -98.526424; elev. 1,142 m asl). It was trapped in a fishing net in a stream visibly populated by *Poecilia* sp. (Cyprinodontiformes: Poeciliidae). Upon collection, we noted that the snake was gravid, prompting us to record data on the snake's weight and length prior to preservation. We subsequently dissected the specimen to inspect and collect data on the embryos and stomach contents. Twelve embryos in a late stage of development (stages 28–31) (Zehr 1962), had a combined weight of 24.9 g, representing 57.9% of the snake's total mass. Using criteria in Altig and McDiarmid (2017) and Stebbins (2003), we identified the remains of two tadpoles taken from the stomach as Rio Grande Leopard Frogs (*Lithobates berlandieri*). These collectively weighed 5 g, corresponding to 11.6% of the snake's total mass. Together, the embryos and prey constituted 69.9% of the snake's total mass at the time of collection.

Previous reports have documented Western Ribbonsnakes preying on *Lithobates catesbeiana*, *L. sphenoccephala*, and *L. clamitans* (Fouquette 1953; Ford and Hampton 2009) but, to the best of our knowledge, these larval *L. berlandieri* represent the first record of this species in the diet of *T. proximus*. The clutch size we observed aligns with reports for populations in Texas and Louisiana, USA (8–12) (Tinkle 1957; Lancaster and Ford 2003) and Nuevo León, Mexico (8–13) (Conant 1965). In a review of the literature, we found only two reports of females sexually mature at smaller sizes than the specimen reported herein. The first, collected in Louisiana, USA, had a SVL of 485 mm and six embryos (Tinkle 1957), whereas the other, collected in Zelaya, Nicaragua, had a SVL of 382 mm and six embryos (Goldberg 2015).

Although the snake described herein does not surpass the minimum length reported for sexual maturity in females, it does represent the first report of a large clutch in a small female, which is unusual considering that female size usually is positively correlated with clutch size (Seigel et al. 1987; Dunlap and Lang 1990). Additional studies focusing on expanding the understanding of *T. proximus* populations in the southern parts of their range (i.e., Mexico and Central America) are needed to generate data for comparisons with their northern counterparts.

### Literature Cited

- Altig, R. and R.W. McDiarmid. 2017. *Handbook of Larval Amphibians of the United States and Canada*. Cornell University Press, Ithaca, New York, USA.
- Conant, R. 1965. Miscellaneous notes and comments on toads, lizards, and snakes from Mexico. *American Museum Novitates* 2205: 1–38.
- Dunlap, K.D. and J.W. Lang. 1990. Offspring sex ratio varies with maternal size in the common garter snake, *Thamnophis sirtalis*. *Copeia* 1990: 568–570. <https://doi.org/10.2307/1446363>.
- Ford, N.B. and P.M. Hampton. 2009. Ontogenetic and sexual differences in diet in an actively foraging snake, *Thamnophis proximus*. *Canadian Journal of Zoology* 87: 254–261. <https://doi.org/10.1139/Z09-008>.
- Fouquette, M.J. 1953. Food competition among four sympatric species of garter snakes, genus *Thamnophis*. *Texas Journal of Science* 6: 172–189.
- Goldberg, S.R. 2015. *Thamnophis proximus* (Western Ribbonsnake). *Reproduction. Herpetological Review* 46: 455.
- Hampton, P.M. 2013. Feeding in natricines: Relationships among feeding morphology, behavior, performance and preferred prey type. *Journal of Zoology* 290: 215–224. <https://doi.org/10.1111/jzo.12029>.
- Lancaster, D.L. and N.B. Ford. 2003. Reproduction in western ribbon snakes, *Thamnophis proximus* (Serpentes: Colubridae), from an east Texas bottomland. *The Texas Journal of Science* 55: 25–33.
- Rossman, D.A., N.D. Ford, and R.A. Seigel. 1996. *The Garter Snakes: Evolution and Ecology*. University of Oklahoma Press, Norman, Oklahoma, USA.
- Seigel, R.A., J.T. Collins, and S.S. Novak. 1987. *Snakes: Ecology and Evolutionary Biology*. Macmillan, New York, New York, USA.
- Stebbins, R.C. 2003. *A Field Guide to Western Reptiles and Amphibians*. 3rd ed. Houghton Mifflin Co., Boston, Massachusetts, USA.
- Tinkle, D.W. 1957. Ecology, maturation and reproduction of *Thamnophis sauritus proximus*. *Ecology* 38: 69–77. <https://doi.org/10.2307/1932127>.
- Uetz, P., P. Freed, R. Aguilar, F. Reyes, J. Kudera, and J. Hošek (eds.). 2023. *The Reptile Database*. <<http://www.reptile-database.org>>.
- Wendelken, P.W. 1978. On prey-specific hunting behavior in the Western Ribbon Snake, *Thamnophis proximus* (Reptilia, Serpentes, Colubridae). *Journal of Herpetology* 12: 577–578. <https://doi.org/10.2307/1563367>.
- Zehr, D.R. 1962. Stages in the normal development of the Common Garter Snake, *Thamnophis sirtalis sirtalis*. *Copeia* 1962: 322–329. <https://doi.org/10.2307/1440898>.