

Field Observations of Predation by the Sonoran Whipsnake (*Masticophis bilineatus*)

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Published reports of direct field observations on predation by snakes are relatively rare. Our search of the primary published literature yielded only four field observations of the prey of *Masticophis bilineatus*: young Woodhouse's Jays (Stejneger 1902) [= Western Scrub Jay, *Aphelocoma californicus*; T. Huels, pers. com.], *Peromyscus* sp. used as carnivore bait (Nickerson and Mayes 1970), *Sceloporus undulatus* (Tinkle and Dunham 1986), and juvenile *Crotalus molossus* (Enderson 1999). In a letter published by Klauber (1956), R. R. Humphrey reports an observation that also may represent *M. bilineatus* feeding on *C. molossus*, but the species identification of both the predator and prey is not entirely clear.

Examination of stomach contents of museum specimens constitutes another approach to documenting the natural diet of snakes (e.g., Greene 1984, Holycross et al. 2002; Rodriguez-Robles et al. 1999). For *Masticophis bilineatus*, Tinkle and Dunham (1986) report that specimens from near Sunflower, Maricopa Co., Arizona, were found to contain lizards or lizard eggs, but do not provide additional details. These authors conclude that the Sonoran Whipsnake is an important predator on *Sceloporus undulatus*, whereas they speculate that raptors are the primary predator on the more arboreal *Sceloporus clarkii*. Camper and Dixon (2000) examined 335 specimens of *M. bilineatus* and found that only 5% contained prey items. The 22 prey items identified included 12 *Cnemidophorus*, 3 *Sceloporus*, 2 *Urosaurus*, 2 mammals, 1 *Cophosaurus*, 1 *Uta*, and 1 unidentified lizard. Species identifications were not provided but can be reasonably assumed for all except the mammals, *Cnemidophorus*, and *Sceloporus*. No birds or bats were present among the food items found by Camper and Dixon (2000) for this and two other species of whipsnakes. Rodriguez-Robles (1998) has commented on the differences in results from examination of stomach contents versus field observations of predation by snakes, particularly on birds, and concludes that both are necessary to gain a full perspective on the dietary niche of a given species of snake.

Many regional and species summaries routinely list one or more of the following food items for *Masticophis bilineatus*: frogs, lizards, small birds, and mammals (Bogert and Oliver 1945, Camper 1996, Degenhardt et al. 1996, Fowlie 1965, Grismer 2002, Klauber 1956, Stebbins 1954, 1985, Van Denburgh 1922, Wright and Wright 1957). In many cases it is unclear whether the listing of these items

is based on either original field observations or published material, as details or citations of the primary literature usually are not provided. One somewhat humorous example is the conclusion of Bogert and Oliver (1945) that "it is quite possible that chicks are sometimes taken by this racer" based on the local name, "culebra de pollo," used in the region around Alamos, Sonora. Of particular interest in terms of the observations reported here is the statement by Stebbins (1954) that the species "eats young birds and lizards (*Sceloporus clarkii* and others)", but unfortunately no details are presented (as they are for his observations on reproduction in the species).



Fig.1 *Masticophis bilineatus* attempting predation of *Sceloporus clarkii*

Our observation and photograph (fig. 1) of a Sonoran Whipsnake attempting predation on an adult Clark Spiny Lizard confirm the listing by Stebbins (1954) of *Sceloporus clarkii* as prey of *Masticophis bilineatus*. The event took place on 15 September 2002 at Martina Mtn., Pima County, Arizona (32° 03.84 N, 111° 26.51W) at ca 1100 hrs. We were attracted to the site by a



Fig. 2 *Masticophis bilineatus* attempting predation of *Cophosaurus texanus*.

loud thrashing noise that appeared to be coming from a large roadside rock. Under the edge of the rock we observed a *M. bilineatus* grasping a large *S. clarkii*. After the photograph was taken, the snake dropped the lizard and escaped, perhaps in response to our movements. Thus it is not entirely clear that this attempted predation by a ca 1 m (total length) *M. bilineatus* on a large *Sceloporus clarkii* (UAZ 54779; male; snout-vent length 113 m) would have been successful.

In the upper reaches of Cañada del Oro in the Santa Catalina Mts., Pima Co., Arizona, R. Repp and D. Caldwell observed and photographed (fig. 2) an adult *Masticophis bilineatus* predating a female Greater Earless Lizard (*Cophosaurus texanus*), providing field documentation of the finding of this prey item among the stomach contents of the Sonoran Whipsnake (Camper and Dixon 2000).

Enderson in September 2000 witnessed a large adult *M. bilineatus* consuming an adult lowland leopard frog (*Rana yavapaiensis*) in Buehman Canyon, Santa Catalina Mts., Pima County, Arizona, thus substantiating that the Sonoran Whipsnake preys on frogs, though no voucher was taken.

That *Masticophis bilineatus* feeds at least occasionally (if not commonly) on *Sceloporus clarkii* is certainly not unexpected as the two occur together across a wide geographic area and are often found in the same habitat (e.g., riparian woodlands, rocky bajadas, and Madrean Woodland; pers. obs.). It is notable that the attempted predation reported here occurred in a marginal habitat for *S. clarkii*, the saguaro-paloverde community, where large riparian trees are not available for escape. In contrast, Tinkle and Dunham (1986) did not report *S. clarkii* among the stomach contents of *M. bilineatus* from their study area, which was along a permanent stream with a well-developed riparian community.

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LITERATURE CITED

- Bogert, C. M., and J. A. Oliver. 1945. A preliminary analysis of the herpetofauna of Sonora. Bull. American Mus. Natur. Hist. 83:297-426.
- Camper, J. D. 1996. *Masticophis bilineatus*. Catalogue of American Amphibians and Reptiles 637:1-4.
- Camper, J. D., and J. R. Dixon. 2000. Food habits of striped whipsnakes, *Masticophis* (Serpentes: Colubridae). Texas J. Sci. 52:83-92.
- Degenhardt, W. G., C. W. Painter, and A. H. Price. 1996. Amphibians and Reptiles of New Mexico. University of New Mexico, Albuquerque. xix + 431 pp.
- Enderson, E. F. 1999. Predation of *Crotalus molossus* (Blacktail Rattlesnake) by *Masticophis bilineatus* (Sonoran Whipsnake), Whetstone Mountains, Arizona. Sonoran Herpetologist 7:72-73.

- Fowle, J. A. 1965. The Snakes of Arizona. Azul Quinta, Fallbrook, California. Iv + 164 pp.
- Greene, H. W. 1984. Feeding behavior and diet of the Eastern Coral Snake, *Micrurus fulvius*. Spec. Publ. Univ. Kansas Mus. Nat. Hist. 10:147-162.
- Grismer, L. L. 2002. Amphibians and Reptiles of Baja California. University of California, Berkeley. xiii + 399 pp.
- Holycross, A. T., C. W. Painter, D. B. Prival, M. J. Goode, D. E. Swann, M. J. Schroff, T. Edwards, and C. R. Schwalbe. 2002. Diet of *Crotalus lepidus klauberi* (Banded Rock Rattlesnake). J. Herpetol. 36:589-597.
- Klauber, L. M. 1956. Rattlesnakes: Their habits, life histories, and influence on mankind. University of California, Berkeley. xxiv + 1476 pp.
- Nickerson, M. A., and C. E. Mays. 1970. A preliminary herpetofaunal analysis of the Graham (Pinaleno) Mountain Region, Graham Co., Arizona with ecological comments. Trans. Kansas Acad. Sci. 72: 492-505.
- Rodriguez-Robles, J. A. 1998. Alternative perspectives on the diet of Gopher Snakes (*Pituophis catenifer*, Colubridae): literature records versus stomach contents of wild and museum specimens. Copeia 1998: 463-466.
- Rodriguez-Robles, J. A., D. G. Mulcahy, and H. W. Greene. 1999. Feeding ecology of the Desert Night Snake, *Hypsiglena torquata* (Colubridae). Copeia 1999:93-100.
- Stebbins, R. C. 1954. Amphibians and Reptiles of Western North America. McGraw-Hill, New York xxii + 528 pp.
- Stebbins, R. C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin, Boston. xiv + 336 pp.
- Stejneger, L. 1902. The reptiles of the Huachuca Mountains. Proc. United States Natl. Mus. 25:149-158.
- Tinkle, D. W., and A. E. Dunham. 1986. Comparative life histories of two syntopic sceloporine lizards. Copeia 1986:1-18.
- Van Denburgh, J. 1922. The Reptiles of Western North America. Occas. Pap. California Acad. Sci. 10:1-1028.
- Wright, A. H. and A. A. Wright. 1957. Handbook of Snakes of the United States. Comstock, Ithaca, New York.

fig. 1 photo by Erik F. Enderson

fig.2 photo by D. J. Caldwell