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Diadophis punctatus (Ring-necked Snake). Diet.

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CROTALUS HORRIDUS (Timber Rattlesnake). HABITAT USE.

On 6 October 2013, a *Crotalus horridus* was observed under an automated corn feeder hung above a small clearing next to an adjacent forest patch on private property in Columbia Co., Lulu, Florida, USA. The snake was present for at least 5 h, noted from timestamps on images taken on a game camera. At 0711 h, it was still dark, and the snake was coiled in the center of the clearing, which was shaded until approximately 1030 h. As the day progressed, photos show the snake continually shifted its position within the plot to stay just out of direct sunlight, remaining at the interface of sun and shade.

At 1243 h, the snake was in the shade next to the only log within the confines of the clearing. It is assumed to have been foraging, as it was in a compact coil position next to the log with its head facing perpendicular to it (Reinert et al. 1984. *Copeia* 1984[4]:976–981). *Odocoileus virginianus* (White-tailed Deer) were observed multiple times from early morning to early afternoon feeding on corn within a few meters of the snake (Fig. 1). In addition to this observation, a *C. horridus* was noticed in the same spot five days earlier, and *C. horridus* have been witnessed on this feeder plot on several occasions, as well as at a different feeder in a forested area ca. 300 m away. Whether the same individuals are being repeatedly seen is unknown.

C. horridus often spend long periods of time at ambush sites (Clark 2006. *Copeia* 2006[2]:181–187) and may have to make tradeoffs between selecting sites for foraging and thermoregulation. Due to the food supply for small mammals, which make up a substantial portion of the diet for *C. horridus* (Clark 2002. *J. Herpetol.* 36:494–499), as well as the lack of canopy cover, clearings with feeders or planted food plots may offer thermoregulatory benefits for snakes while simultaneously attracting prey (Hampton et al. 2010. *Am. Midl. Nat.* 163:44–53). Because the clearing in this observation is surrounded by a fence to deter feral hogs, which are known predators of pit-vipers, it may also afford added protection from predation.



FIG. 1. *Crotalus horridus* (Timber Rattlesnake) in an ambush position near an *Odocoileus virginianus* (White-tailed Deer) at an automated corn feeder in Columbia Co., Florida, USA.

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DIADOPHIS PUNCTATUS (Ring-necked Snake). DIET. *Diadophis punctatus* shows considerable dietary diversity among and within populations. This includes heavy reliance on prey items as diverse as earthworms and other invertebrates, amphibians, or squamate reptiles, which challenges the commonly held assumption that these are earthworm specialists (reviewed by Ernst and Ernst 2003. *Snakes of the United States and Canada*. Smithsonian Books, Washington, DC. 680 pp.). O'Donnell et al. (2007. *Toxicon* 50:810–815) reviewed the chemistry of oral secretions and instances of apparent envenomation of prey items by some, but not all, populations of *D. punctatus* across its range (see also chemical analyses by Hill and Mitchell 2000. *Toxicon* 38:1663–1687). Mitchell (1994. *The Reptiles of Virginia*, Smithsonian Inst. Press, Washington, DC. 352 pp.) stated that prey items in Virginia, USA, were killed by constriction—a behavior not reported by other authors (e.g., Henderson 1970. *Herpetologica* 26:520–526; but see also references cited therein). O'Donnell et al. (*op. cit.*) and Ernst and Ernst (*op. cit.*) presented direct evidence of lethal envenomation by oral secretions from *D. punctatus* on several taxa. We (JRM, unpubl. data) once observed a *Plethodon serratus* become motionless and evidently dead (no heartbeat visible) within seconds of a predatory bite by a sympatric *D. punctatus* from LeFlore Co., Oklahoma, USA. There are conflicting reports of human envenomations (e.g., Myers 1965. *Bull. Florida State Mus. Nat. Hist.* 10:43–90; Henderson, *op. cit.*; Shaw and Campbell 1974. *Snakes of the American West*. Alfred A. Knopf, New York, New York. 330 pp.).

An adult *D. punctatus* (UCSB 25830; SVL = 148 mm; preserved mass = 6.25 g) found on More Mesa, Goleta, Santa Barbara Co., California, USA, on 11 April 1987 contained a visible abdominal bulge consistent with a large prey item. After capture, the snake regurgitated a subadult *Elgaria multicarinata* (UCSB 25831; minimum SVL = 52 mm; preserved/dry mass = 1.5 g; keeling on dorsal scales evident). This is the first record of *Elgaria* in the diet of *Diadophis* of which we are aware (Ernst and Ernst, *op. cit.*).

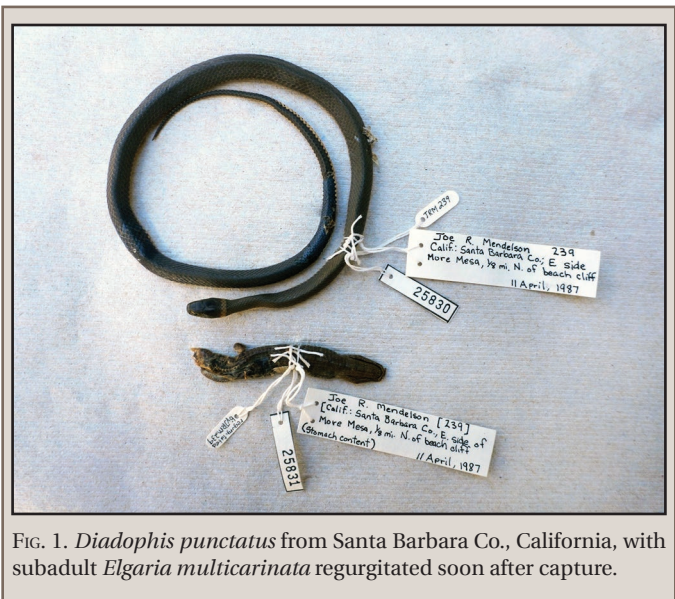


FIG. 1. *Diadophis punctatus* from Santa Barbara Co., California, with subadult *Elgaria multicarinata* regurgitated soon after capture.

The lizard prey was sufficiently digested, and missing part of the tail, such that calculation of prey/predator mass ratio can only be approximated (0.24, post preservation). Nevertheless, it is a large prey item for such a diminutive snake (Fig. 1) and *Elgaria* spp. are capable of formidable antipredator bites. We have observed (JRM, unpubl. data) a variety of obligate constricting snakes (e.g., *Lampropeltis* spp.) to become incapacitated, or badly injured, by the antipredatory bite-and-hold response of *E. multicarinata*; furthermore, these observations of *Lampropeltis* spp. included snakes proportionally much larger than is this *D. punctatus* with respect to the intended prey items. All points considered together, we conclude that *D. punctatus* in central California are capable of subduing robust squamate prey species, supporting the suggestion by O'Donnell et al. (*op. cit.*) that venom evolved in this species to facilitate subjugation of larger prey items.

The variety of prey items and feeding behavior and contradictory reports of effects of bites delivered to humans by *Diadophis* suggest that considerable geographic variation in the diet, behavior, and perhaps oral secretions of this snake exists. We emphasize the observation by O'Donnell et al. (*op. cit.*) that snakes referable to *D. p. edwardsii* lack the enlarged rear fangs that are present in the other putative subspecies. We suggest that carefully documented feeding trials involving snakes from various regions and presented with a variety of types of potential prey would reveal a surprising diversity of results perhaps consistent with the complex evolutionary history of these snakes (Fontanella et al. 2007. *Mol. Phylog. Evol.* 46:1049–1070; Fontanella and Siddall 2010. *Zool. J. Linn. Soc.* 158:629–640).

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DIADOPHIS PUNCTATUS (Ring-necked Snake). DIET. *Diadophis punctatus* is a fossorial species that ranges across much of the United States into southeastern Canada (Ernst and Ernst 2003. *Snakes of the United States and Canada*. Smithsonian Books, Washington, DC. 668 pp.). On 3 June 2011, I found a



FIG. 1. A *Diadophis punctatus* (Ring-necked Snake) that had consumed a *Ramphotyphlops braminus* (Brahminy Blindsnake), discovered after being hit by a lawn mower in Naples, Florida, USA.

dead *D. punctatus* in a recently mowed yard at 5823 Spanish Oaks Lane, Naples, Florida, USA (26.265215°N, 81.724880°W; datum WGS84). The *D. punctatus* was apparently hit by a mower and upon discovery I noticed a prey item, a *Ramphotyphlops braminus* (Brahminy Blindsnake), an established exotic species in Florida. Given the condition of the *D. punctatus*, it was likely killed the same day it was found. The lack of significant digestion of the *R. braminus* suggests it was recently consumed (Fig. 1).

Diadophis punctatus primarily feeds on small vertebrates, including other native snake species and conspecifics (Ernst and Ernst, *op. cit.*). While other fossorial snake species have been documented to consume *R. braminus*, such as *Stilosoma extenuatum* (Short-tailed Snake; Godley et al. 2008. *Herpetol. Rev.* 39:473–474) and *Micrurus fulvius* (Harlequin Coralsnake; Krysko et al. 2010. *Herpetol. Rev.* 41:501–502), this observation represents the first recorded occurrence of *D. punctatus* consuming a *R. braminus*.

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EPICRATES CRASSUS (Eastern Rainbow Boa). DIET. *Epicrates crassus* occurs in open grassland habitats in Bolivia, central Brazil, Paraguay, and northern Argentina (Passos and Fernandes 2008. *Herpetol. Monogr.* 22:1–30). In Paraguay most modern records are from the Cerrado zone and it is classed as vulnerable at the national level (Motte et al. 2011. *Cuad. Herpetol.* 23:5–18). It is considered to be the most terrestrial member of the genus and feeds mainly on small mammals, and occasionally birds (Pizzatto et al. 2009. *Amphibia-Reptilia* 30:533–544). At ca. 2100 h on 3 March 2014, a mature female *E. crassus* (estimated SVL = 972 mm) was found dead, apparently deliberately decapitated, on a dirt road ca. 8 km from Santa Rosa del Aguaray, Depto. San Pedro, Paraguay (23.8363°N, 56.3899°W; datum WGS84). The surrounding habitat consisted of wet grassland with nearby eucalyptus plantations. The snake had ingested an adult female *Cavia aperea* (Pampas Cavy; Mammalia: Caviidae; alcohol specimen CZPLT-M 438) with greatest length of skull 23 mm. *Cavia aperea* is a new prey species for *E. crassus* and with mean head-body length of 274 mm (Asher et al. 2004. *J. Mammal.* 85:788–796), and mean body mass of 523.6 g (Künzl and Sachser 1999. *Horm. Behav.* 35:28–37), is larger than other prey items previously reported (Pizzatto et al. 2009, *op. cit.*). The *Epicrates* specimen is deposited at the Para La Tierra Colección Científica housed at Reserva Natural Laguna Blanca, Departamento San Pedro, specimen number CZPLT-H 697.

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HETERODON PLATIRHINOS (Eastern Hog-nosed Snake). REPRODUCTION / NEST SITE FIDELITY. Nest site fidelity is poorly documented in snakes, and in *Heterodon platirhinos* it has been documented only in Ontario, Canada, near the species' northernmost range limit (Cunnington and Cebek 2005. *Am. Midl. Nat.* 154:474–478). Here, we present evidence of nest site fidelity of *H. platirhinos* from a population in Saratoga Co., New York, USA. As part of a radio-telemetry study, we observed a large female (SVL = 78 cm, mass = 618 g) nesting in a utility right-of-way (characterized by an open canopy and early successional plant