Monte Escobedo, Zacatecas, México (22.47803°N, 103.50617°W; WGS 84; 2203 m elev.). The snake held the lizard by the neck for ca. 5 min, but due to our presence the snake released the lizard and hid in an adjoining rock wall. The lizard was slightly injured and stunned for a few minutes, but then hid in the same stone wall ca. 20 cm from the snake. To our knowledge, *S. melanogaster* is a new prey for *S. bairdi*.

LOURDES DE LA TORRE-ROBLES, Programa Multidisciplinario de Posgrado en Ciencias Ambientales, Agenda Ambiental, Universidad Autónoma de San Luis Potosí, Av. Manuel Nava No. 201, 2do Piso, Zona Universitaria, C.P. 78210, San Luis Potosí, S.L.P. México (e-mail: dtr.lourdes@gmail.com); **GUSTAVO ERNESTO QUINTERO-DÍAZ** (e-mail: gequintmxags@hotmail.com) and **RUBÉN ALONSO CARBAJAL-MÁRQUEZ**, Departamento de Biología, Centro de Ciencias Básicas, Universidad Autónoma de Aguascalientes, C.P. 20100, Aguascalientes, Aguascalientes, México (e-mail: ruben.carbajal@edu.uaa.mx).

***TANTILLA HOBARTSMITHI* (Smith's Black-headed Snake). PREDATION.** *Tantilla hobartsmithi* is a small (up to 313 mm total length), slender, flat-headed colubrid snake (Stebbins 2003. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Co., Boston, Massachusetts. 544 pp.). The species is fossorial and highly secretive, primarily being found beneath rocks or other objects in wetter areas, such as riparian, grassland, chaparral, and woodland habitats (Cole and Hardy 1981. Bull. Amer. Mus. Nat. Hist. 171:223). Consequently, it has a disjunct distribution in the United States, occurring within suitable habitats in Arizona, California, western Colorado, southern Nevada, southern New Mexico, southern Texas, and Utah (Ernst and Ernst 2003. Snakes of the United States and Canada, Smithsonian Books, Washington, D.C. 668 pp.; Cole and Hardy 1981, *op. cit.*). There are few documented occurrences of *T. hobartsmithi* being preyed upon. Punzo (1999. Bull. Br. Arachnol. Soc. 11:121–128) documented predation by an *Aphonopelma hentzi* (Texas Brown Tarantula) in Texas, USA. McKeever and Jones (2022. Herpetol. Rev. 53:348) described what appeared to be predation by a scorpion in the genus *Hadrus* in Clark County, Nevada, USA. Lastly, a photograph was submitted to iNaturalist of a pholcid spider (cellar spider) preying upon a *T. hobartsmithi* suspended in a web at the Arizona-Sonora Desert Museum in Tucson, Arizona, USA (https://www.inaturalist.org/observations/15193514, 25 May 2023). Herein, we provide additional observations of an arachnid species preying upon *T. hobartsmithi*.

PHOTO BY RENEE GRAYSON

FIG. 1. *Tantilla hobartsmithi* in web of a juvenile female *Latrodectus hesperus* observed on 14 July 2022 at the Springs Preserve, Las Vegas, Clark County, Nevada USA.

At ca. 0730 h on 14 July 2022, a juvenile female *Latrodectus hesperus* (Western Black Widow) was observed preying upon a *T. hobartsmithi* (Fig. 1) at the Springs Preserve in Las Vegas, Clark County, Nevada, USA (36.17462°N, 115.18405°W; WSG 84). The *T. hobartsmithi* appeared to have already died prior to the onset of the observation. The *T. hobartsmithi* was hanging from a web erected upon an interpretive panel, ca. 50–60 cm above a concrete pad along a hiking trail within the Springs Preserve. When approached, the *L. hesperus* would retreat to a crevice on the underside of the interpretive panel. The following day, there was no sign of either the spider or snake, including any remains. The underside of the panel, however, had a dense collection of spider webbing and numerous unidentified pholcid spiders. On 23 August 2022, a second dead *T. hobartsmithi* was observed within a concrete access corridor to an outdoor exhibit at the Springs Preserve (36.17246°N, 115.19087°W; WSG 84). The *T. hobartsmithi* (205 mm total length, 2.75 g) had what appeared to be puncture wounds consistent with the size of a spider bite. These observations expand the number of arachnid species known to prey upon *T. hobartsmithi* and suggest they may be important predators of this snake species.

RENEE GRAYSON, The Springs Preserve, 333 S Valley View Boulevard, Las Vegas, Nevada 89107, USA (e-mail: renee.grayson@springspreserve.org); **JASON R. ECKBERG**, Southern Nevada Water Authority, 100 City Parkway, Suite 700, Las Vegas, Nevada 89106, USA (e-mail: jason.eckberg@snwa.com); **THOMAS O'TOOLE**, The Springs Preserve, 333 S Valley View Boulevard, Las Vegas, Nevada 89107, USA (e-mail: thomas.o'toole@springspreserve.org); **RAYMOND A. SAUMURE**, Southern Nevada Water Authority, 100 City Parkway, Suite 700, Las Vegas, Nevada 89106, USA (e-mail: insculpta@gmail.com).

***THAMNOPHIS COUCHII* (Sierra Garter Snake), *T. HAMMONDII* (Two-striped Garter Snake), and *T. SIRTALIS* (Common Garter Snake). TAIL LOSS and INJURY.** Tail loss is the most common predator-induced injury among squamates (Arnold 1984. J. Nat. Hist. 18:127–169; Arnold 1988. *In* Gans and Huey [eds.], Biology of the Reptilia, pp. 235–273. Alan R. Liss Inc., New York, New York; Bateman and Fleming. 2009. J. Zool. 277:1–14; Higham et al. 2013. Physiol. Biochem. Zool. 86:603–610). Indeed, many lizards are well-known for caudal autotomy—the specialized ability to "shed" the portion of the tail grasped by a predator (Arnold 1988, *op. cit.*). Though snakes lack the sophisticated traits associated with true caudal autotomy, such as intravertebral fracture planes and tail regeneration (Arnold 1984, *op. cit.*; Arnold 1988, *op. cit.*), several clades are capable of easy tail breakage (Mendelson 1992. Herpetologica 48:448–455; Gregory and Isaac 2005. Herpetol. J. 15:213–219; Dourado et al. 2013. Copeia 2013:132–141; Pleguezuelos et al. 2018. Acta Herpetol. 13:65–73), often referred to as pseudoautotomy (Slowinski and Savage 1995. Herpetologica 51:338–341). Certain garter snake species (*Thamnophis*) are among these and, when grabbed by the tail, may whirl or writhe to shear off the seized portion of the tail, which then twitches as a distraction (Willis et al. 1982. Copeia 1982:98–101; Fitch 1999. A Kansas Snake Community: Composition and Changes over 50 Years. Krieger Publishing Company, Malabar, Florida. 165 pp.; Fitch 2003 Herpetol. Rev. 34:212–213; Placyk and Burghardt 2005. Amphib.-Reptil. 26:353–358; Todd and Wassersug 2010. Amphib.-Reptil. 31:213–215). Here, we report three instances of tail loss in western garter snakes, two of which are the first records for their respective species, *T. couchii* and *T. hammondii*. Our report is also noteworthy because of the remarkable amount of

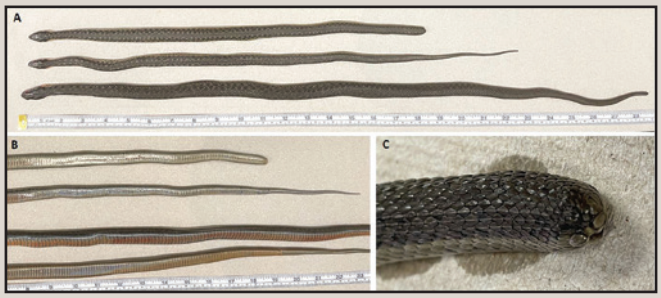

FIG. 1. A) *Thamnophis hammondii* with tail and lower body injury (top), alongside similar sized *T. hammondii*; B) closer view of posterior ends (injured snake at bottom); C) close up of healed injury.

FIG. 2. A) *Thamnophis sirtalis* with tail and lower body injury (middle), alongside similar sized *T. sirtalis*; B) closer view of caudal ends (injured snake in middle); C) close up of healed injury.

injury sustained and overcome by two of these snakes, which included the entire tail and caudal portion of body.

On 5 August 2021, at 1810 h, CRF encountered an adult *T. couchii* at the Cold Stream Ponds, SW of Truckee, Placer County, California, USA (39.30847°N, 120.24501°W; WGS 84; 1842 m elev.). The snake was basking on the bare shoreline along the eastern edge of the pond, but when approached, rapidly fled to a series of large granite boulders 3–6 m upslope of the pond. As the snake dove into a crevice under the nearest bolder, CRF grasped its tail, whereupon the snake firmly wedged its body against the boulder and within the underground burrow, pulling powerfully against human grip, until suddenly the tail gave way and separated from the snake. The tail break was similar in nearly all respects to caudal autotomy in lizards, with a sudden and clean release, rather than a gradual tearing of tissue, minimal blood loss (though more than in lizards), and persistent wriggling of the separated tail for several minutes. Because the released tail allowed the snake to escape capture, we cannot estimate the proportion of the tail (or body) that was lost, though it measured 79 mm, and appeared to be most of the tail. On 13 July 2022, at 1840 h, at the same field site, CRF had a similar experience with a smaller (subadult) *T. couchii*. In this instance the snake retreated to a grass tussock 2 m upslope of the pond, and when grasped by the tail, violently spun so that the tail quickly sheared off while being held. Again, the snake evaded capture, and the broken portion of the tail, which measured 27 mm, wriggled vigorously for several minutes.

On 12 June 2021, at 1335 h, ELE found an adult *T. hammondii* in an unnamed stream in Hot Springs Canyon, in the Santa Ana Mountains, Orange County, California, USA (33.60630°N, 117.51022°W; WGS 84; 243 m elev.). The snake was focused on foraging among decomposed leaves at the bottom of a quiet pool, and was easily collected by hand, at which point ELE noticed the snake was missing a significant portion of its caudal end. In fact, the snake did not possess a tail, an anal plate or vent, and the tissue at the caudal end had healed over the lesion site. The snake weighed 60.2 g and measured 465 mm in total length, with 160 ventral scales. As part of an ongoing project, our lab also possessed three similarly sized *T. hammondii* (1 male, 2 female) from another site (San Luis Obispo Co., CA) as useful live references. These snakes averaged 64.2 g, 516 mm SVL, 126 mm TL, with 173 ventral scales and 74 caudal scales (excluding anal plate in both counts). Thus, the injured *T. hammondii* had 13 fewer ventral scales and 74 fewer caudal scales than the mean of our small sample. Though we cannot determine with certainty the proportion of body lost to injury, we estimate this snake lost at least 120 mm of its posterior body and tail (including an estimated 80 vertebrae), representing ca. 20% of its total length (Fig. 1).

On 19 July 2020, at 1530, CRF encountered an adult *T. sirtalis* in a seasonal pond at the Galbreath Wildlands Preserve in Mendocino County, California, USA (38.85077°N, 123.26598°W; WGS 84; 568 m elev.). Upon capture, it was obvious that the snake was missing the vent, anal plate, and the remainder of its tail. Despite lacking an obvious cloacal opening, the snake was able to eject feces (but not musk), typical of many garter snakes trying to evade predation (Stebbins 2003. Western Reptiles and Amphibians, 3rd ed., Houghton Mifflin Company, New York, New York. 533 pp.). The injured snake weighed 18 g and was 350 mm in total length, with 161 ventral scales. Six other *T. sirtalis* of similar size (4 male, 2 female) were caught that day at the same site. The mean size of these snakes was 20.8 g, 365 mm SVL, and 129 mm TL, with an average of 165 ventral scales and 90 caudal scales (excluding anal plate in both counts). The injured snake possessed 90 fewer caudal scales and 4 less ventral scales than our sample mean. We estimate that the injured snake lost at least 130 mm of tail and caudal end of body (including an estimated 90 vertebrae), representing over 35% of its total length (Fig. 2).

Snakes often sustain injuries during the course of their lives, many of which prove fatal (Fahrig and Rytwinski 2009. Ecol. and Soc. 14:21; Jezova and Jablonski 2018. Herpetol. Rev. 49:348; Moore and Hecnar 2018. Herptol. Rev. 49:299). Nevertheless, snakes are resilient and frequently survive traumatic injuries and endure (Greene 1973. J. Herpetol. 7:143–161; Fitch 2003, *op. cit.*; Weidler et al. 2017. Herpetol. Rev. 48:664; Heyborne et al. 2020. Herpetol. Rev. 51:358–359), including deep lacerations (Wassenberg et al. 2001. Biol. Conserv. 100:271–280; Borczyk 2004. Hepetol. Bull. 90:22–26; Heyborne et al. 2020, *op. cit.*), penetration by foreign objects (Weidler et al. 2017, *op. cit.*) and tail loss (Mendelson 1992, *op. cit.*; Gregory and Isaac 2005, *op. cit.*; Ushakov 2007. Russ. J. Ecol. 38:124–127). Here, both a *T. hammondii* and a *T. sirtalis* survived physical trauma that led to the loss of their entire tails, and some portion of their posterior bodies. The injuries had healed over with fibrous scar tissue, leaving blunted ends to the bodies (Fig. 1), yet in both cases the alimentary canals were not sealed and both snakes could still retain and pass fecal material. Despite the fact that such loss likely impaired physical performance, ranging from sprinting and swimming (Aubret et al. 2005. J. Exp. Zool. 303:894–903) to grasping and mating (Semlitsch and Gibbons 1982. Copeia 1982:974–976), both snakes were in excellent condition. In fact, we maintained the *T. hammondii* in the lab for eight months, and the *T. sirtalis* for four months, and both displayed fairly natural locomotor abilities, normal appetites, and were capable of regular urinary and fecal excretions. The latter is noteworthy

because the cloaca receives urinary and digestive products, and is important in feces formation and retention. The fact that uric acid and feces were expelled properly, and feces appeared normal, suggests the final portion of the large intestine (and associated sphincter muscles) either retained function or those functions were gained by the posterior most intestinal segments that remained. Regardless, reproduction would have been hindered or impossible for these snakes. We dissected each to identify gonads and determine sex, and found the *T. hammondii* was a female, and the *T. sirtalis* a male. It is not clear if the injured *T. hammondii* would have been able to successfully copulate and retain sperm. The injured *T. sirtalis*, which lost both hemipenes, would certainly be unable to reproduce. Thus, while these snakes were capable of seemingly natural movements, foraging success, and physiological functions, their reproductive fitness following injury may have been highly impaired.

We deposited all snakes as voucher specimens in the herpetology collection of the University of Nevada, Reno Museum of Natural History (UNR): *T. hammondii* CRF 3746 (injured), 3742, 3743, 3765; *T. sirtalis* CRF 3644 (injured), 3642, 3643, 3645, 3674, 3648. We thank California Department of Fish and Wildlife (CAF&W) for permits to CRF (SC-814) and ELE (SC-5399), and UNR IACUC for approval of live animal protocols to CRF. We are grateful to Emily Taylor and Ryan Sikola for field assistance, and Margot Rawlins and Sonoma State University for land access.

KELLY E. ROBINSON, Department of Biology and Program in Ecology, Evolution and Conservation Biology, University of Nevada, Reno, Nevada 89557, USA (e-mail: kellyrobinson4788@gmail.com); **EDWARD L. ERVIN**, Merkel & Associates, Inc., San Diego, CA USA (e-mail: EErvin@merkelinc.com); **MIKE B. TEGLAS**, Department of Agriculture, Veterinary and Rangeland Sciences, University of Nevada, Reno, Nevada 89557, USA (e-mail: mteglas@unr.edu); **CHRIS R. FELDMAN**, Department of Biology and Program in Ecology, Evolution and Conservation Biology, University of Nevada, Reno, Nevada 89557, USA (e-mail: ophis@unr.edu).

***THAMNOPHIS PROXIMUS* (Western Ribbonsnake). DIET.** *Thamnophis proximus* feeds primarily on fish and amphibians (Ernst and Ernst 2003. Snakes of the United States and Canada. Smithsonian Books, Washington, D.C. 668 pp.). Within their diet, anurans are the most commonly ingested taxa (Ernst and Ernst 2003, *op. cit.*; Hampton 2008. Southwest. Nat. 53:115–118). Herein, we report on an observation of *T. proximus* ingesting another species of anuran.

On 30 June 2023, in the late morning, we regurgitated a partially digested *Lithobates blairi* (Plains Leopard Frog) from an adult *T. proximus* in Barber County, Kansas, USA (37.0999°N, 98.9936°W; WGS 84). The *T. proximus* was swimming atop the water's surface along the edge of a fishless earthen pond. Many small newly metamorphosed *L. blairi* were present around the pond's edge. To our knowledge, no prior published observations document *L. blairi* in the diet of *T. proximus* (Ernst and Ernst 2003, *op. cit.*; Hampton 2008, *op. cit.*). Although published observations of predation on *L. blairi* are scarce, records exist for other *Thamnophis* species preying upon *L. blairi*, such as *T. cyrtopsis* (Black-necked Gartersnake), *T. radix* (Plains Gartersnake), and *T. sirtalis* (Common Gartersnake) (Dodd 2013. Frogs of the United States and Canada, Volume 2. Johns Hopkins University Press, Baltimore, Maryland. 982 pp.; Tye and Geluso 2019. Herpetol. Rev. 50:603). Conversely, *T. proximus* is known to prey upon other species of *Lithobates*, including *L. catesbeianus* (American Bullfrog), *L. clamitans* (Green Frog), and *L. sphenocephalus* (Southern Leopard Frog) (Hampton 2008, *op. cit.*).

MACKENZIE J. SMITH (e-mail: smithmackenziej@gmail.com), **JOSEPH W. PAYSEN**, Department of Biology, University of Nebraska at Kearney, Kearney, Nebraska 68849, USA; **CARTER KRUSE**, Turner Institute of Ecoagriculture, Bozeman, Montana 59718, USA; **KEITH GELUSO**, Department of Biology, University of Nebraska at Kearney, Kearney, Nebraska 68849, USA (e-mail: gelusok1@unk.edu).

***THAMNOPHIS RADIX* (Plains Garter Snake). INGESTION ATTEMPT OF FOREIGN OBJECT.** *Thamnophis radix* is a widespread natricine with a distribution encompassing much of central North America, particularly within the Great Plains (Conant and Collins 1998. Peterson Field Guide to Reptiles and Amphibians of Eastern Central North America. 3rd Ed. Houghton Mifflin Harcourt, New York, New York. 640 pp.). Both diurnal and nocturnal, they are active hunters (Vechiet et al. 2018. Herpetol. Rev. 49:558) with a diverse diet including amphibians, small rodents, and fishes (Ernst and Ernst 2003. Snakes of the United States and Canada. Smithsonian Books, Washington, D.C. 668 pp.; Tuttle and Gregory 2009. J. Herpetol. 43:65–73; Phillips et al.

PHOTO BY JOHNNY BAAKLINY

FIG. 1. Adult female *Thamnophis radix* attempting to consume a foreign object (ear plug) Champaign County, Illinois, USA.

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FIG. 2. The ear plug taken from the *Thamnophis radix*, shown in the hand of the author for scale. Champaign County, Illinois, USA.