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# Anniella grinnelli (Bakersfield Legless Lizard) Predation.

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FIG. 1. A communal nest site of *Anadia bogotensis*, showing eggs and hatched eggshells.



FIG. 2. A former *Anadia bogotensis* communal nest site, now colonized by carpenter ants.

is likely that the ants are interfering with nesting behavior and hatchling development by driving adults away, or consuming eggs or hatchlings. Communal nesting can result from limited nest sites (Doody et al. 2009. *Quart. Rev. Biol.* 84:229–251); thus, in paramo habitats, humidity and temperature gradients may limit the availability of places suitable for egg laying and successful incubation. Moreover, communal nesting has been suggested to increase fitness in hatchlings of other lizard species (Radder et al. 2007. *J. Anim. Ecol.* 76:881–887).

Climate change has been identified as one of the drivers that have caused ecological shifts in reproductive phenology and high extinction rates of native species, caused by abrupt changes in distribution (Parmesan et al. 2003. *Nature* 421:37–42). Ant populations have shown different responses to global warming such as increasing their altitudinal range and abundance (Kwon et al. 2015. *J. Asia-Pacific Biodivers.* 8:49–65). However, studies on high altitude ants in the neotropical region are scarce, and the dynamics of their range and population trends influenced by climate change remain unknown. We note that prior to 2010, nests without ants were common. The invasion by these ants suggests that *Camponotus cf. nitens* are expanding to higher elevations (showing an increase in the number of colonies), a trend that may threaten Andean lizards that lay communally. Nest displacement by ant colonization is thus an environmental stressor for *A. bogotensis* that could cause significant behavioral changes in this species, affecting survival and recruitment. Finally, we suggest further research on this interaction since it might be an emergent threat brought by climate change, affecting this vulnerable and endemic high altitude lizard.

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**ANNIELLA GRINNELLI (Bakersfield Legless Lizard). PREDATION.** *Anniella grinnelli* is a recently described species of anguiform lizard known only from Kern and San Luis Obispo counties in south-central California, USA (Papenfuss and Parham 2013. *Breviora* 536:1–17). Due to the secretive nature and recent recognition of this species, information on the predators of *A. grinnelli* is absent from the literature. On 26 March 2017 we conducted surveys for *Anniella* at the Pixley National Wildlife Refuge in Tulare County, California, USA. During these surveys, we encountered a dead adult *A. grinnelli* (Fig. 1) which had been impaled by *Lanius ludovicianus* (Loggerhead Shrike) on a barbed wire fence at the edge of the property (35.90635°N, 119.33169°W; WGS 84). The specimen was collected and deposited in the Museum of Vertebrate Zoology, University of California, Berkeley, California, USA (MVZ 272791) along with a *Uta stansburiana* (MVZ 272790) found similarly impaled on the same stretch of fence. *Lanius ludovicianus* is a known predator of reptiles including *A. pulchra*, a more widely distributed relative of *A. grinnelli* (Clark 2011. *Son. Herpetol.* 24:20–22). However, to our knowledge this observation represents the first confirmed predator of *A. grinnelli* in the literature. Additionally, this specimen represents the first record of *A. grinnelli* in Tulare County, CA (Papenfuss and Parham, *op. cit.*).

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**ANOLIS CAROLINENSIS (Green Anole). DIET.** *Anolis carolinensis* is native to the coastal plain of the southeastern United States and is considered a dietary generalist, feeding on a variety of insects, spiders, and other arthropods (Conant and Collins 1998. *Reptiles and Amphibians of Eastern and Central North America*).



FIG. 1. *Anniella grinnelli* (MVZ 272791) impaled on a barbed wire fence by *Lanius ludovicianus*.

3<sup>rd</sup> Ed. Houghton Mifflin, New York. 616 pp.). As generalists, their diet is apparently only restricted by size. Herein, we report on a rare observation of *A. carolinensis* feeding on a vertebrate. Our observation also represents what we believe to be the first record of an *A. carolinensis* regurgitating another lizard.

On 13 October 2016, between 1200–1215 h, an adult female *A. carolinensis* (SVL = 49 mm, total length = 139 mm, weight = 2.1 g) was detected inside an upright PVC pipe set up as part of a sampling array for a long-term study of amphibian use of upland Longleaf Pine ephemeral sinkhole ponds in the Ocala National Forest (29.32391°N, 81.74823°W). Skies were sunny and the temperature was approximately 27°C. While weighing this individual, it regurgitated about half of an adult *Scincella lateralis* (Little Brown Skink), and, after a few minutes, the complete body. With a body girth (~6–8 mm) more than a quarter that of its predator and a total length (~80 mm) over half that of its predator, the *S. lateralis* was an exceptionally large prey item for *A. carolinensis*. The *S. lateralis* had not yet lost any coloration, although some exterior scales were partially digested. We have captured dozens of *A. carolinensis* during each of the last 24 years in the field, but this was the first time that we witnessed one regurgitating prey upon capture, suggesting that prey size and (or) species was a contributing factor to this behavior. This observation occurred under Florida Fish and Wildlife Conservation Commission permit # LSSC-12-00021A.

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**ANOLIS EQUESTRIS (Knight Anole). TAIL TRIFURCATION.** *Anolis equestris* is native to Cuba and established in southern Florida (Meshaka 2011. Herpetol. Conserv. Biol. 6:1–101). Regeneration of multiple tails is thought to be due to tail injury without tail breakage (Bellairs and Bryant 1985. In Gans and Billett [eds.], Biology of the Reptilia, Volume 15, Development B, pp. 301–410. Wiley-Interscience, New York). Tail trifurcation has been reported in the lizard genera *Ctenosaura* (Iguanidae; Ariano-Sanchez and Gil-Escobedo 2016. Herpetol. Rev. 47:463–464), *Cyclura* (Iguanidae; Hayes et al. 2012. Biodivers. Conserv. 21:1893–1899), *Lacerta* (Lacertidae; Graper 1909 In Bellairs and Bryant, *op. cit.*), *Hemidactylus* (Gekkonidae; Evans and Bellairs 1983 In Bellairs and Bryant, *op. cit.*), *Gekko* (Gekkonidae; Das 1933 In Bellairs and Bryant, *op. cit.*), and *Mabuya* (Scincidae; Brindley 1898 in Bellairs and Bryant, *op. cit.*).

At 2045 h, 22 May 2016 we found an adult male *A. equestris* (Fig. 1; 157 mm SVL, 175 mm tail length, 80 g) sleeping on a thin branch ~3 m aboveground in second growth forest adjacent to an avocado orchard (25.425483°N, 80.501383°W, WGS 84; 22 m elev.) southwest of Florida City, Miami-Dade County, Florida, USA. The trifurcation (Fig. 1) was 113 mm posterior to the cloaca and consisted of a split on the ventral side of the tail resulting in two newly regenerated tail tips, a left prong (27.2 mm) and right prong (36.4 mm) that projected from beneath the central axis of the tail which extended 61.7 mm beyond the split. The right prong was the same color as the proximal part of the tail and may have represented the original portion of the tail. To our knowledge this is the first report of tail trifurcation in this species.

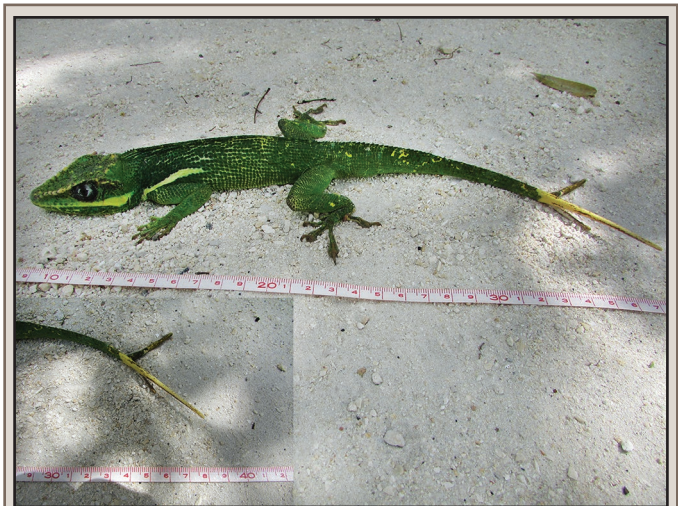


FIG. 1. Adult male *Anolis equestris* with a trifurcated tail. Inset showing that the central axis of the tail is yellow.

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**ANOLIS EQUESTRIS (Cuban Knight Anole). DIET.** *Anolis equestris* is native to Cuba and present as a nonindigenous species