in Kolkata, India. I observed an adult *H. flaviviridis* with a small conspecific juvenile in its mouth on a wall adjacent to a park. The juvenile appeared to thoroughly subdued, and possibly dead, as it did not show any movement. It took 5–6 min for the adult to completely ingest the juvenile headfirst, and afterward it retreated behind a bamboo structure on the wall. The second observation occurred at 1825 h on 8 May 2022, on the floor inside a home (22.61638°N, 88.38908°E; WGS 84; 9 m elev.) in Kolkata, India. In this instance I saw a juvenile *H. flaviviridis* attacking a smaller conspecific, holding the smaller lizard by the left hind leg. The larger gecko made slight movements while holding the smaller gecko, with the latter biting the attackers head behind the eye (video: https://doi.org/10.5063/F1BG2MFD). The attacking gecko repeatedly thrashed the smaller gecko on the floor until it no longer moved, it then readjusted its grip towards the head and swallowed headfirst. The entire event took 11–12 min to completely ingest the prey. To my knowledge, this is the first report of cannibalism in *H. flaviviridis* under natural conditions.

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***HOLBROOKIA LACERATA* (Plateau Spot-tailed Earless Lizard) and *HOLBROOKIA SUBCAUDALIS* (Tamaulipan Spot-tailed Earless Lizard). BURYING BEHAVIOR.** *Holbrookia lacerata* and *H. subcaudalis* are phrynosomatid lizards that are documented to bury (Neuharth et al. 2018. Herpetol. Rev. 49:536–537), most likely for thermoregulation, predator avoidance, and to lay eggs (Axtell 1956. Bull. Chicago Acad. Sci. 10:163–179). Neuharth et al. (2018, *op. cit.*) only states that *Holbrookia* species bury, but did not describe their behavior in doing so. Herein, we describe the burying behavior for both species and propose explanations as to the difference in their two approaches of burying.

On the afternoon of 29 June 2021, at 1145 h, we observed an adult-sized, male *H. lacerata* (61 mm SVL) on sparsely vegetated ground between a dirt road and cotton field, near San Angelo, Tom Green County, Texas, USA (31.38180°N, 100.16092°W; WGS 84; 563 m elev.). We had surrounded the lizard and were ca. 2 m from it when it ran towards the base of a forb ca. 1 m away, which was growing in loosely packed sandy loam soil. Immediately upon reaching the forb the lizard began vigorously shaking its head side-to-side and dove head-first into the soil, simultaneously shimmying its body and tail side-to-side while using its legs to propel itself forward as it submerged itself under the loose soil. This process happened quickly and we estimate it required <2 s to become completely buried by ca. 2–3 mm of soil at its tail-end and ca. 10–20 mm underground towards the head. The burying trajectory was ca. 20° downward angle from the soil surface and once buried the *H. lacerata* was completely camouflaged exhibiting an effective anti-predation strategy, in this case to our group conducting lizard surveys. If we had not observed this behavior the lizard would not have been detectable by our visual survey techniques.

For a companion study to determine *Holbrookia* sp. detectability, we collected 17 *H. lacerata* from the same vicinity near San Angelo, Tom Green County, Texas, USA (31.39325°N, 100.24550°W; WGS 84; 563 m elev.) and 35 *H. subcaudalis* from the same vicinity near Agua Dulce, Nueces County, Texas, USA (27.71525°N, 97.85425°W; WGS 84; 39 m elev.). Each lizard was placed in individual 38 L aquaria equipped with 10 cm of sandy loam soil substrate, heat lamps, UV lights, and video monitoring cameras. While in captivity, all *H. lacerata* (N = 17) and *H. subcaudalis* (N = 35) were observed burying in the soil substrate via the head-first shimmy method described above if we attempted to hand-capture them for measurement purposes. However, in the absence of a potential predation threat (i.e., hand-capture), we observed daily burying behaviors by both species using a different burying strategy. When not pursued, individuals would first vigorously shake their tail and back legs on soft soil until its back half was submerged buried. This shimmying would continue and progress up the body towards the head until it buried itself under soil at a ca. 20–30° angle to the surface until its entire body was buried. The head would be the last body part to be covered. The caudal end of the lizard would be buried to a depth of 10–20 mm, while the anterior end would be near the soil surface, but still camouflaged by the surrounding soil particles. The entire process required 4–5 s.

Table 1. Comparison of time required to initiate burial behavior (s) and burial time (s) between *Holbrookia lacerata* (N = 17) and *H. subcaudalis* (N = 35) and between the head-first (escape flight) and tail-first (relaxed) burial behaviors, conducted in captive setting during August 2021. Means with the same capital letter are not different ($P > 0.05$) between species within the same treatment. Means with the same lower-case letter are not different ($P > 0.05$) between treatments within the same species.

Burial strategy[1]	Initiate burial time (s) Mean ± SE (range)	Burial time (s) Mean ± SE (range)
Holbrookia lacerata[2]		
Head first	25.1 ± 0.6Aa[3] (22–32)	2.2 ± 0.1Aa (2–3)
Tail first	–	4.6 ± 0.2Ab (4–6)
Holbrookia subcaudalis[2]		
Head first	25.2 ± 0.5Aa (20–31)	2.3 ± 0.1Aa (2–3)
Tail first	–	4.8 ± 0.1Ab (4–6)

[1] Treatment effect was observed ($F_{1,100} = 496.5$, $P = 0.0001$), but not a species*treatment interaction ($F_{1,100} < 0.10$, $P > 0.75$).
[2] Species effect was not observed ($F_{1,100} < 2.20$, $P > 0.14$).

To verify the reason for the difference in shimmy methods (i.e., headfirst versus tail-first) as burial behavior, we conducted outdoor experimental trials in August 2021 that consisted of a 2.5 m diameter × 1 m tall plastic tub, which contained 30 cm deep sandy loam soil substrate and a video monitoring camera. Lizards were placed individually into the outdoor tub at 0900 h and allowed an hour to acclimatize to the surroundings. At 1000 h, the same person would enter the tub and chase the lizard until the lizard would initiate burial behavior. The video camera recorded the behavioral process and time to initiate burial behavior, method of burial behavior, and time required to bury were noted. Lizards were allowed time to re-emerge to the surface on their own and their behavior was monitored via video camera.

We used a general linear model analysis of variance SAS Institute 1999. SAS/STAT Software, v9. SAS Institute, Inc., Cary, North Carolina) to test the main effects of species and burial method (i.e., headfirst or tail-first), and their interaction, on the time to initiate burial and burial time by species. Assumptions of homogeneity of variances among treatments and normality were verified. All means are reported ± 1 standard error.

Our laboratory experiment found that all *H. lacerata* and *H. subcaudalis* used one of the two burying techniques, either head-

or tail-first, depending on urgency of escape (Table 1). The very rapid headfirst approach was consistently used as a predator escape strategy, whereas the slightly slower tail-first approach was used when not under duress from a predator (Table 1). No species effect ($F_{1,100}$ < 2.20, P > 0.14) or species-treatment interaction ($F_{1,100}$ < 0.10, P > 0.75) occurred; however, a treatment effect was observed ($F_{1,100}$ = 496.5, P = 0.0001). The head-first escape behavior was completed faster by *H. lacerata* (2.2 ± 0.1 s vs. 4.6 ± 0.2 s) and *H. subcaudalis* (2.3 ± 0.1 s vs. 4.8 ± 0.1 s), respectively, than the tail-first behavior. We hypothesize that the headfirst approach better protects the lizard from a predator-induced head injury; while the tail-first approach, where the head is at the surface would allow the lizard to detect changes in ambient light, and thus, emerge during ideal conditions for feeding and thermoregulation.

Burying in soil substrate appears to be a common behavior used by both *H. lacerata* and *H. subcaudalis*, as documented by Neuharth et al. (2018, *op. cit.*). However, such behavior requires the soil substrate to be loosely compacted, which may not always be the case, as reported by Hibbitts et al. (2021. J. Nat. Hist. 55:495–514). In locations where the substrate is more compacted or gravelly, as reported by Hibbitts et al. (2021, *op. cit.*) and Neuharth et al. (2018, *op. cit.*), approximately half of their encounters with *H. lacerata* and *H. subcaudalis* the lizards did not bury into substrate but hid under detritus and beneath forb cover. Therefore, the likelihood of burying may be an inverse relationship to soil compaction.

The collection of specimens for this study was approved by Texas Parks and Wildlife Department Scientific Permit Number SPR-0620-085 and the handling and use of animals by Texas A&M University-Kingsville IACUC number 2021-03-08/1469.

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***HOLBROOKIA LACERATA* (Plateau Spot-tailed Earless Lizard) and *HOLBROOKIA SUBCAUDALIS* (Tamaulipan Spot-tailed Earless Lizard). HABITAT USE.** *Holbrookia lacerata* and *H. subcaudalis* inhabit native grasslands and agricultural fields, both row crop and mowed fields, in Texas, USA (Hibbitts et al. 2021. J. Nat. Hist. 55:495–514). Recently, *H. lacerata lacerata* and *H. lacerata subcaudalis* were elevated from subspecies status and split into two distinct species (Hibbitts et al. 2019. Zootaxa 4619:139–154). Following this split, *H. lacerata* is found in central Texas north of the Balcones escarpment, and *H. subcaudalis* is found in the Tamaulipan biotic province of southern Texas and adjacent northern Mexico (Hibbitts et al. 2019, *op. cit.*). Few studies have been conducted on either species and, little is known of their basic natural history and general ecology, including their plasticity of using different substrates, although Hibbitts et al. (2021, *op. cit.*) found that both *H. lacerata* and *H. subcaudalis* favor highly compacted substrates which typically are associated with greater percentages of clay soils. Here we expand on the substrate characteristics each species uses in a different environment from Hibbitts et al. (2021, *op. cit.*).

TABLE 1. Comparison of mean ± standard error for soil particle size and compaction at points used by *Holbrookia lacerata* (N = 17) and *H. subcaudalis* (N = 35) at sites within Tom Green and Nueces counties, Texas, USA, respectively, during July–August 2021.

Soil parameter	*H. lacerata* Mean ± SE (range)	*H. subcaudalis* Mean ± SE (range)	t-value (50 df)	*P*
Sand (%)	84.7 ± 2.2 (67–96)	86.9 ± 0.9 (76–100)	1.18	0.28
Silt (%)	9.9 ± 1.8 (0–25)	9.9 ± 0.8 (0–21)	0.01	0.97
Clay (%)	5.5 ± 0.9 (0–14)	3.2 ± 0.4 (0–8)	7.41	0.01
Compaction (1–20)	5.9 ± 0.7 (2–12)	4.8 ± 0.4 (1–10)	1.99	0.17

During lizard collection surveys between July and August 2021, we collected 17 *H. lacerata* near San Angelo, Tom Green County, Texas, USA (31.40660°N, 100.33027°W; WGS 84; 563 m elev.) and 35 *H. subcaudalis* near Agua Dulce, Nueces County, Texas, USA (27.71883°N, 97.86860°W; WGS 84; 39 m elev.). Soil compaction of the initial site of observation for each lizard was measured with a Lang penetrometer (Forestry Supplier, Jackson, MS 39201) and a 200 g soil sample was collected from the same site. Soil particle size distribution was analyzed using the hydrometer method outlined by Gee and Bauder (1986. *In* Klute [ed.], Methods of Soil Analysis, pp. 383–411. American Society of Agronomy, Madison, Wisconsin). Soil particle size use between species was analyzed using a student's t-test (SAS Institute 1999. SAS/STAT Software, v9. SAS Institute, Inc., Cary, North Carolina).

In all instances we found *H. lacerata* and *H. subcaudalis* occurred adjacent to crop fields of either cotton or milo in areas with a soil texture consistent of sand, loamy sand, and sandy loam (67–100% sand, 0–25% silt, and 0–14% clay; Table 1). Soils were loosely compacted, and compaction averaged 5.2 ± 0.4 (Table 1), which was significantly less than reported by Hibbitts et al. (2021, *op. cit.*) for both species (15.1 ± 2.2 and 17.2 ± 2.6 for *H. lacerata* and *H. subcaudalis*, respectively). We found no differences in soil use between these *Holbrookia* species, except for % clay where *H. lacerata* was observed at locations with a greater percentage of clay than *H. subcaudalis* (Table 1), however, percentages were small and did not alter soil texture classification. These results suggest that *H. lacerata* and *H. subcaudalis* may have a greater niche breadth and preference regarding soil compaction than previously documented.

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***HOLCOSUS QUADRILINEATUS* (Four-lined Whiptail). DIET.** *Holcosus quadrilineatus* (formerly *Ameiva quadrilineata*) is a small teiid lizard that occurs at forest edges and open habitats adjacent to tropical lowland forest throughout much of southern Central America (Savage 2002. The Amphibians and Reptiles of Costa Rica: a Herpetofauna between Two Continents, Between Two Seas. University of Chicago Press, Chicago, Illinois. 512 pp.). In the only dietary study of *H. quadrilineatus*, to our knowledge,