

and distance to the edge of the river. All data are presented in Table 1.

Temperature of each oviposition site's substrate was measured during peak *A. aquaticus* activity hours (ca. 1000–1600 h) with an IR thermometer within 1 cm of the egg's location. Average substrate temperature of the 10 oviposition sites was 19.58°C ( $\pm$  1.24 SE). During the same field season at these sites, we also recorded substrate temperatures of 413 *A. aquaticus* capture locations, which had an average temperature of 20.38°C ( $\pm$  1.83 SE). Variation in oviposition site substrate temperature (ranging only 3.6°C) was smaller than that of perch sites (ranging 18.6°C).

The sole previous study on *A. aquaticus* reproduction incidentally notes that eggs were found exclusively in crevices in which they were in contact with small permanent springs, which was proposed as a strategy for avoiding desiccation (Márquez and Márquez 2009. *Bol. Técnico Ser. Zool.* 8:50–73). No additional details about *A. aquaticus* oviposition site characteristics are reported by Márquez and Márquez (2009, *op. cit.*). In our survey, only one of the 10 oviposition sites that we found was fed by a small spring (Fig. 1B). At our sites, high humidity within crevices (usually > 90%) might negate the need for direct contact with water and reduce the related risk of eggs being washed away at times of high water flow. Streams at our sites are wider (ca. 2–8 m wide) than the site described in Márquez and Márquez (2009, *op. cit.*) (1 m maximum width) and also experience occasional flooding. Despite their small range of this species, it is possible that *A. aquaticus* populations vary substantially in preferred oviposition sites given the relatively large differences in stream site characteristics (e.g., humidity, temperature, and stream width and flow) among populations.

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**ANOLIS CRISTATELLUS (Puerto Rican Crested Anole) and ANOLIS SAGREI (Brown Anole). INTERSPECIFIC MATING.** Biological invasions bring species separated by evolutionary time into contact in novel environments. Co-occurrence can result in interspecific courtship and mating leading to sexual interference that potentially mediates outcomes of novel species interactions (Dame and Petren 2006. *Anim. Behav.* 71:1165–1173). Southern Florida, USA hosts numerous non-native lizard species including anoles. *Anolis cristatellus* was introduced from Puerto Rico to southern Florida in the 1970s where it competes with *A. sagrei*, which was introduced to Florida from Cuba and the Bahamas (Kolbe et al. 2007. *Conserv. Biol.* 21:1612–1625). Interspecific mating has been observed in *Anolis* previously, including between a native and invasive species (Sater and Smith 2018. *Herpetol. Rev.* 49:114–115).

At 1750 h on 9 May 2018, I observed a male *A. cristatellus* pursuing and mating with a female *A. sagrei* at Montgomery Botanical Center in Miami-Dade County, Florida (25.66042°N, 80.28233°W; WGS 84; Fig. 1). Copulation lasted 3–4 minutes. To



FIG. 1. Male *Anolis cristatellus* mating with female *Anolis sagrei* in Miami-Dade County, Florida, USA.

my knowledge, this is the first observation of interspecies mating between *A. cristatellus* and *A. sagrei*.

Both individuals had previously been captured at the site and given unique beadtags (visible in Fig. 1). The male *A. cristatellus* had an SVL = 47 mm, and the female *A. sagrei* had an SVL = 42 mm (both individuals measured two weeks prior to this observation). The male *A. cristatellus* was smaller than many other males present at this site. A nearby larger male *A. cristatellus* did not continue pursuit of the smaller male (interaction visible in video of the encounter available at: <https://youtu.be/uENAPjdQhUg>) after it began mating with the *A. sagrei*. It is possible that interspecific mating might allow smaller males to mate within territories of more dominant males with less danger of provoking territorial defense. Three other species of anoles are present at the site, including the native *A. carolinensis* and invasive *A. distichus* and *A. equestris*, raising the possibility of sexual interference between multiple species of anoles in this area. Given the evolutionary distinctness of these species (Poe et al. 2017. *Syst. Biol.* 66:663–697.), however, successful hybridization is unlikely.

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**ANOLIS SAGREI (Brown Anole). PREDATION.** *Anolis sagrei* is native to Cuba and the Bahamas, and has been introduced to areas of the Pacific, Caribbean, and southeastern United States, including Texas and Florida (Kolbe et al. 2007. *Mol. Ecol.* 16:1579–1591). Across its native range, *A. sagrei* has many avian predators, including passerines (Henderson and Powell 2009. *Natural History of West Indian Reptiles and Amphibians*. University Press of Florida, Gainesville, Florida. 520 pp.). However, the extent of avian predation on *A. sagrei* in its non-native range is less known. Here we report observations of Loggerhead Shrike (*Lanius ludovicianus*) predation on *A. sagrei* in its non-native range (Texas and Florida, USA).

The Loggerhead Shrike is a passerine native to North America and is known to create “larders” of smaller vertebrate and invertebrate prey items by impaling them on natural and



FIG. 1. Adult male *Anolis sagrei* impaled on a Callery Pear (*Pyrus calleryana*) tree in remnant prairie habitat in eastern Texas, USA.

artificial substrates (Clark 2011. *Son. Herpetol.* 24:20–22). The Loggerhead Shrike preys on a variety of lizard species, including native Green Anoles (*Anolis carolinensis*) (Clark 2011, *op. cit.*), but its range does not overlap with that of native *A. sagrei*.

On 18 January 2018 at approximately 1400 h, one of us (SES) observed an adult male *A. sagrei* that had been impaled on a Callery Pear (*Pyrus calleryana*) in a remnant Gulf Coast prairie at the Lawther-Deer Park Prairie Preserve, Texas (29.6696°N, 95.1063°W; WGS 84) by *L. ludovicianus* (Fig. 1; accessible at <https://www.inaturalist.org/observations/9522909>). Loggerhead Shrikes are the only species in the area known to impale prey items on vegetation for future consumption. Similarly, in 2011 one of us (STG) observed two independent instances of *A. sagrei* impaled on a small tree in North Miami, Florida (25.9055°N, 80.1368°W; WGS 84). The habitat was an open, park-like area with scattered trees and dense anole populations. A pair of *L. ludovicianus* frequented the area between 2009 and 2013, and although prey capture was not observed, predation by *L. ludovicianus* appears to be the most likely explanation for the impaled anoles.

Together, these observations show that *L. ludovicianus* likely consumes invasive *Anolis sagrei* across their shared range in the United States. Our observations correspond well with reports from Taiwan, where invasive *A. sagrei* are preyed on by the Brown Shrike (*L. cristatus*), a congener of the Loggerhead Shrike (Chiu et al. 2011. *Herpetol. Notes* 4:87–89). These data suggest that native avian predators may commonly predate invasive *A. sagrei*, a novel but potentially common and valuable food source.

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**ANOLIS STRATULUS (Barred Anole). NOCTURNAL FORAGING ACTIVITY.** *Anolis stratulus* is a relatively small member of the trunk-crown ecomorph found on Puerto Rico, the British Virgin Islands, and the U.S. Virgin Islands (Schwartz and Henderson 1991. *Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History*. University of Florida Press, Gainesville, Florida. xvi + 720 pp.). *Anolis stratulus* commonly occupies urban habitats where artificial light at night is present (Winchell et al. 2017. *Ecol. Evol.* 8:25–35).

Artificial light at night is a novel habitat disturbance common in cities and other human-occupied habitats. Some organisms, including many reptiles, have modified their activity periods to take advantage of the novel resources such lighting can provide, such as increased prey density, a phenomenon termed the “night light niche” (Perry et al. 2008. *In* Mitchell et al. [eds.], *Urban Herpetology*, pp. 239–256. SSAR, Salt Lake City, Utah).

On 14 April 2015 between 2100–2200 h, a single adult *A. stratulus* was observed at Tamarindo States Apartments, Culebra, Puerto Rico, USA (18.1846°N, 65.1858°W; WGS 84). The individual was in survey posture (Stamps 1977. *Copeia* 1977:756–758) on a vertical artificial substrate and positioned below an artificial light source at a height of 4 m on the wall of an outdoor terrace. The anole jumped on the ground to capture and consume a spider (Araneae) and several other unidentified arthropods that moved below the light. No other lizards were observed in the area at the same time. To our knowledge, this is the first documented case of *A. stratulus* taking advantage of a source of artificial light at night to capture prey. Video of the event is available at <https://youtu.be/8lFYhqr3z3A>.

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**ASPIDOSCELIS COSTATUS BARRANCARUM (Barranca Whiptail). CLUTCH SIZE.** Our knowledge of the reproduction of *Aspidoscelis costatus barrancarum* is limited to two previous published accounts based on clutch sizes from very few individuals (Zweifel 1959. *Bull. Amer. Mus. Nat. Hist.* 117:57–111; Walker et al. 2003. *Herpetol. Rev.* 34:366). Here, we add to the number of observed clutch sizes for *A. c. barrancarum* with data from Chínipas, Chihuahua. We dissected several specimens of *A. c. barrancarum* (N = 25 total) from the vicinity of 27.39441°N, 108.53611°W (WGS 84; 469 m elev.; see Lemos-Espinal et al. 2004. *Bull. Chicago Herpetol. Soc.* 39:164–168) in the University of Colorado Museum collection. Of these specimens, three females contained oviductal eggs (mean ± 1 SE: 94 ± 4 mm SVL; range: 90–102 mm). Mean (± SE) clutch size of *A. c. barrancarum* was 3.0 ± 1.52 eggs (range: 1–6; N = 3). This mean clutch size is at the lower end of the clutch sizes of other populations of *A. c. barrancarum* and *A. costata*. Previously reported clutch sizes of *A. c. barrancarum* from Guirocoba, Sonora, and Batópilas, Chihuahua ranged from 3 to 4 eggs (Zweifel 1959, *op. cit.*; Walker et al. 2003, *op. cit.*). Mean clutch sizes for other subspecies of *A. costatus* range from 2.6–7.7 eggs (*A. c. huico*: 4.4 [Walker 2008. *Herpetol. Rev.* 39:85–86]; *A. c. costatus*: 2.6 [Zaldívar-Rae et al. 2008. *Southwest. Nat.* 53:175–184], 6.3 [Lara-Resendiz et al. 2013. *Rev. Mex. Biodiv.* 84:701–704]; *A. c. nigrigularis*: 4.4 [Walker 2008. *Herpetol. Rev.* 39: 86–87]; *A. c. griseocephala*: 3.8 [Walker 2010. *Herpetol. Rev.* 4:351]; *A. c. costatus*: 7.7 [López-Moreno et al. 2016. *Rev. Mex. Biodiv.* 87:1336–1341]).