

ANOLIS INSIGNIS (Decorated Anole). PREDATION ATTEMPT.

Anolis insignis is one of five giant anole species in Costa Rica (Savage 2002. The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas. University of Chicago Press, Chicago, Illinois, 954 pp.; Poe and Ryan 2017. Amphib. Rept. Conserv. 11:1–16). It occurs in the Cordillera Central and Cordillera de Tilarán, at elevations of 500–2000 m inside secondary mature forests and primary forest, where it is an uncommonly observed canopy species (Savage 2002, *op. cit.*; Poe and Ryan 2017, *op. cit.*). Here, we report a predation attempt on *A. insignis* by an Azure-hooded Jay *Cyanolyca cucullata* (Corvidae: Aves).

Our observation was made in Las Gemelas waterfalls, Valverde Vega, Alajuela Province, Costa Rica (10.25°N, 84.26°W, WGS 84; 1200 m elev.), on 3 March 2018 at 1053 h. The observation site near the Gata River is a mature secondary premontane rainforest with a high density of ferns, orchids, bromeliads, and mosses. The forest is surrounded by land used for cattle grazing. The observation started when RJ heard an Azure-hooded Jay calling loudly from the lower branches of the canopy. He observed two jays attacking an *A. insignis* on a liana 10 m above the ground (Fig. 1). The anole was perched along the liana facing the jay and with the dewlap displayed. The jays focused their attack at the base of the anole's tail, whereupon the anole turned and attacked the jays with mouth open and dewlap displayed (Fig. 1). The anole also tried to keep the tail turned toward its head or hanging down to avoid attack. After 12 attacks from the jay, the anole dropped to the ground, where it remained static with the mouth open and the dewlap displayed. Meanwhile, one jay pecked 30 times at the right foreleg over a 45-sec interval. Then the jay pecked 19 times at the tail base over a 39-sec interval. Our observations took approximately 15 min, at which time the anole still alive without any visible injuries although one jay continued pecking at the anole's tail base.

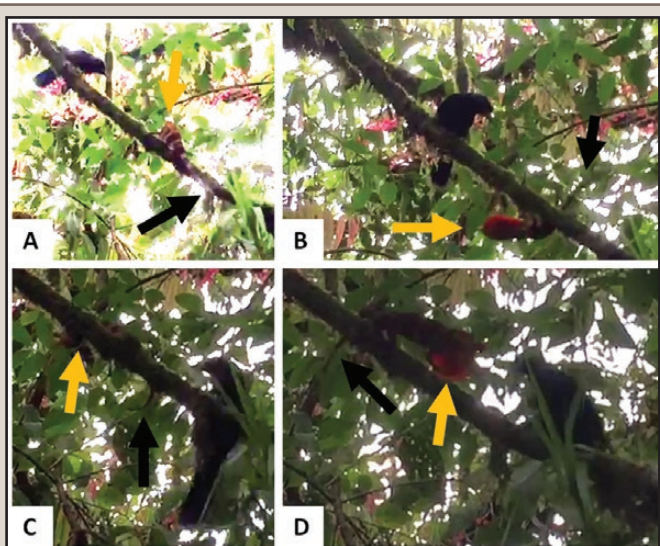


FIG. 1. Azure-hooded Jay (*Cyanolyca cucullata*) attacking an *Anolis insignis* at the sub-canopy liana, Alajuela Province, Costa Rica, on 3 March 2018. Yellow arrow indicates position of the head and extended dewlap of the anole. Black arrow is pointing the tail. A) The jay was attacking near the tail, but the anole responded by reorienting to face the jay. B) The anole is moving forward in defensive display. C) The jay again directs its attack toward tail from another position. D) The anole advances toward the jay with open mouth and dewlap displayed. (Photos were obtained from a video made with a cell phone).

The Azure-hooded Jay is a member of the corvid family (dos Anjos 2009. *In* del Hoyo et al. [eds.], Handbook of the Birds of the World. Volume 14. Bush-shrikes to Old World Sparrows, pp. 494–640. Lynx Edicions, Barcelona, Spain), that inhabits cloud forest and forest edges between 800 and 2100 m elev., from eastern Mexico to the Caribbean slope of Panama and occurs locally across Pacific slope of Costa Rica and Panama (Stiles and Skutch 1989. A Guide to the Birds of Costa Rica. Cornell University Press, Ithaca, New York, 632 pp.). Azure-hooded Jays often move in flocks of 3–10 individuals looking for food (invertebrates and small fruits) at all forest levels, from the ground to canopy (Stiles and Skutch 1989, *op. cit.*). This is a first report of attempted predation of *A. insignis*, as well as the first indication that Azure-hooded Jays might include vertebrates in their diet.

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ANOLIS SAGREI (Brown Anole). ENVIRONMENTALLY CUED HATCHING.

Environmentally cued hatching (ECH), in which embryos adjust timing of hatching in response to changing risks, is widespread but uncommon in oviparous animals (Warkentin 2011. Integr. Comp. Biol. 51:14–25). One type of ECH is early hatching, in which embryos hatch early in response to increased predation risk (Warkentin 2011, *op. cit.*). Early hatching has been documented in lizards, including in two species of anoles (Doody et al. 2011. Int. Comp. Biol. 51:49–61). An egg of *Anolis equestris* hatched explosively when handled (Hernandez et al. 2017. Herpetol. Rev. 48:841), and eggs of *A. sagrei* hatched in response to being immersed in water (Losos et al. 2003. Oecologia 137:360–362). However, in the latter case, hatching may have been confounded by handling (in response to vibrations). Herein, we report a case of early hatching in response to handling (a likely predator cue) in *A. sagrei*.

At ~1400 h on 25 August 2017 we found eggs and eggshells of *A. sagrei* in between stacked bricks (log concrete edger®) in a backyard in St. Petersburg, Florida, USA (27.72876°N, 82.63675°W). For details on the nest sites see Doody et al. (2017. Herpetol. Rev. 48:841). We found seven intact eggs and 34 hatched eggshells. Invertebrates near the eggs included pillbugs (Armandillidiidae), slugs (Gastropoda), and ants (Hymenoptera). Eggs were incubated in moist soil under ambient conditions.

Beginning on 26 August, one of us (JSD) handled each egg for five minutes daily, rolling it between the thumb and pointer finger, in an attempt to induce hatching via vibrations. On 28 August, one egg hatched explosively in hand after 15 sec of rolling; the hatchling immediately leaping from the egg across and off the hand and onto the ground. On 15 September, a second egg hatched after rolling it for 45 sec; this hatchling hatched within 4 sec, and began running immediately across the hand. Hatchlings were confirmed as *A. sagrei* (the only other anole species in the area, *A. carolinensis*, is easily distinguishable from *A. sagrei*).

Our crude experiment confirmed explosive hatching in response to handling in *A. sagrei*. It is likely that vibrations were the cue, and that early (induced) hatching in *A. sagrei* embryos is