



A Nonnative Black Spiny-tailed Iguana, *Ctenosaura similis* (Squamata: Iguanidae), Preying on a Native Eastern Gray Squirrel, *Sciurus carolinensis* (Mammalia: Sciuridae), in Southern Florida

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The Black Spiny-tailed Iguana (*Ctenosaura similis*) is a large-bodied iguanid with a natural distribution that ranges from the Yucatan Peninsula in Mexico to Panama (Fitch and Henderson 1978). This species has been introduced into southern Florida and has established populations on the Gulf (Gasparilla Island, Charlotte and Lee Counties) and Atlantic (Key Biscayne, Miami-Dade and Broward Counties) Coasts (Krysko et al. 2003; Townsend et al. 2003; Avery et al. 2014). *Ctenosaura similis* reportedly undergoes an ontogenetic shift in diet with juveniles primarily insectivorous and adults chiefly herbivorous (Montanucci 1968; Fitch and Henderson 1978; Krysko et al. 2009). In their native range, these lizards consume leaves, flowers, and fruits, and Traveset (1990) suggested that they might be an important seed disperser, in addition to preying on a diversity of invertebrates and vertebrates that includes insects, spiders, crabs, bats, rodents, fish, frogs, hatchling sea turtles, lizards, birds, lizard and bird eggs, and its own eggs and juveniles (Montanucci 1968; Fitch and Henderson 1978; Arndt 1999; Krysko et al. 2009; Cedeno-Vazquez and Beutelspacher-García 2016). In its introduced Floridian range, *Ctenosaura similis* is known to consume 39 species of plants, 13 species of invertebrates, and four species of vertebrates (Avery et al. 2009; Krysko et al. 2009; Stroud and Krysko 2013; Krysko and Juan 2014). Herein, I describe a putative predation event on an adult Eastern Gray Squirrel (*Sciurus carolinensis*) on Key Biscayne, Florida.

At 1323 h on 4 September 2021, while photographing wildlife in the old zoo grounds of Crandon Park Gardens on Key Biscayne, I observed an adult male and a female *Ctenosaura similis* on mowed grass at the edge of a tree-lined pond (25.703362, -80.157126). As I began photographing the pair, I noticed the male was standing over and repeat-

edly biting a stationary brown object. After a few seconds I realized this object was a squirrel and began recording video. The male bit the squirrel in the head and vigorously shook it for a period of 2 sec before releasing it and again standing over the body. One minute later the male moved forward 1 m and began a head-bobbing display. The female then moved closer and inspected the squirrel. The male immediately turned around and chased her away, picked the squirrel up by the head, vigorously shook the squirrel, and dragged its body approximately 2 m into the undergrowth. This sequence of events was captured on video (<https://youtu.be/l1Bkt5sUSAc>).

In the undergrowth, the male stood over the squirrel for an hour, occasionally biting it on the head and picking it up in its mouth. After an hour, the male left the squirrel and moved approximately 2 m back to the open grass and began prominently displaying. I left the area for 10 min. Upon my return, I heard rustling and found the male in the undergrowth with the squirrel's head in his mouth. I left for 5 min. When I returned, I heard rustling and, when I approached the male, he ceased moving but again had the squirrel's head in his mouth. When I approached to within 2.5 m, the male dragged the squirrel by the tail 2 m farther into thick undergrowth near the edge of the pond. The male appeared to have a large blood spot on his shoulder and the squirrel had a gash on its neck. I returned 30 min later at 1520 h and found the male on the mowed grass near the edge of the brush, where he performed a head-bobbing display. The dead squirrel was in thick undergrowth a few meters beyond the male. At 1740 h I again returned to the site and found the male (confidently identified by the blood spot on the left shoulder) perched about 1 m up a tree trunk. The squirrel appeared untouched from its previous position. At 0810 h on the following day, I

returned to the site. Two smaller *Ctenosaura similis* that were lying on the mowed grass fled, but I found no sign of the male. The body of the squirrel had shifted position slightly

but was otherwise intact. At 1700 h on the next day, I did not find any ctenosaurs in the immediate vicinity (only numerous Green Iguanas) and could not locate the squirrel's body.

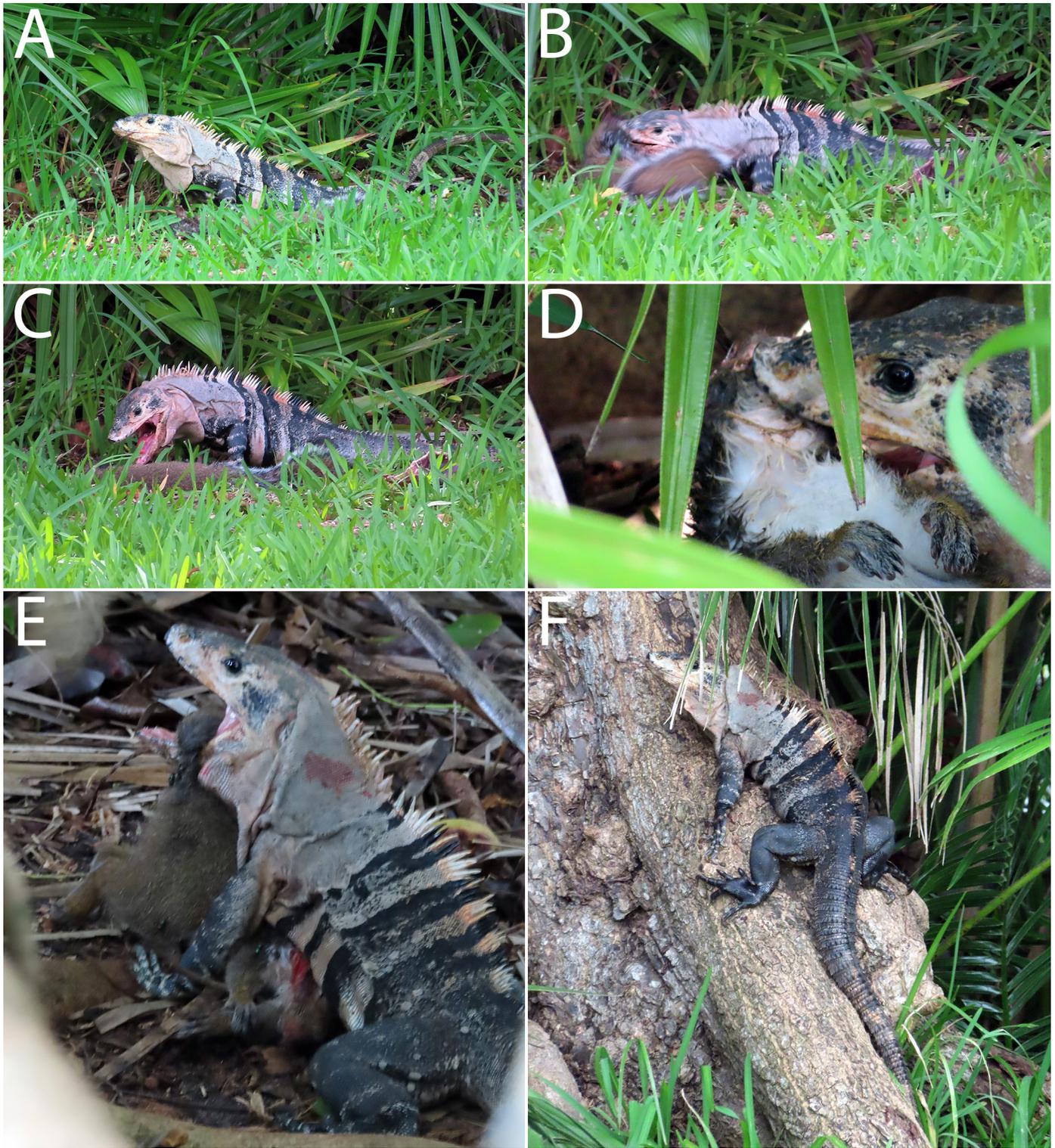


Fig. 1. An adult male nonnative Black Spiny-tailed Iguana (*Ctenosaura similis*) presumably preying on a native Eastern Gray Squirrel (*Sciurus carolinensis*) at Crandon Park, Key Biscayne, Miami-Dade County, Florida: The iguana standing over the body of the squirrel (A), vigorously shaking it (B), biting its head (C), biting the head after dragging the squirrel into the brush (D), dragging it farther into the brush (E), and perched prominently on a tree trunk (F). Photographs by the author.

When I first encountered the male, the squirrel was not moving and presumably dead, raising the question as to whether it was killed in an active predation attempt or found dead and scavenged. For several reasons, predation seems the more likely scenario. Approximately 20 min earlier, I had walked by this site and had not seen a dead squirrel laying in the grass. Secondly, the male repeatedly bit the squirrel in the head and within the first 20 sec of observation had grabbed the squirrel's head in his jaws and vigorously shook it. This suggests the male still may have been in hunting mode and/or ensuring the prey was dead. If scavenging an already dead squirrel, the repeated biting of the head in particular and vigorous shaking of the body would not be expected behavior. Finally, the squirrel had blood on the head and neck but otherwise appeared intact and looked to be fresh.

If the squirrel was prey, how did the male catch it? *Ctenosaura similis* has been described as the world's fastest lizard, having attained the highest reported sprint speed (34.6 km/h) of any measured lizard (Garland 1984). I have personally witnessed the speed at which they can flee toward cover when approached too closely. In Crandon Park, the same day as the above observations, I saw two adult Eastern Gray Squirrels hopping along the treeline and in the open grass. They seemed rather tame and allowed a close approach. In addition to *Ctenosarua similis*, Crandon Park contains a very high density of Green Iguanas (*Iguana iguana*), which are primarily herbivorous and therefore pose no threat. Only large male *Ctenosaura similis* are likely to attain the size required to pose a predation threat. When all these factors are considered, one potential scenario is that the squirrel was unaware of a potential predation threat posed by large individuals of this particular species and therefore passed close enough to the male that all it may have taken was a lunge or short burst of explosive speed for the squirrel to be captured. Certainly the manner in which the male grabbed the dead squirrel by the head and vigorously shook it like a rag-doll suggests it is capable of subduing prey of this size. However, if prey, why was the squirrel not eaten immediately? Possible explanations include the squirrel being too large to swallow whole and the male, perhaps unable to tear off suitably sized chunks, simply gave up after trying to do so for over an hour. Alternatively, although I tried to minimize disturbance, my presence could have inhibited normal feeding behavior.

This is the first putative documentation of a Black Spiny-tailed Iguana preying on and apparently attempting to consume a squirrel. In the native range, *Ctenosaura similis* is known to consume smaller rodents (genera *Oryzomys*, *Sigmodon*, and *Scotinomys*) and bats (genus *Eumops*) (Fitch and Henderson 1978; Cedeno-Vazquez and Beutelspacher-García 2016, and references therein). In Florida, this species is known to consume four species of vertebrates, including three species of lizards (Krysko et al. 2009; Krysko and Juan 2014) and a juvenile Gopher Tortoise (*Gopherus polyphemus*) (Avery et al. 2009). My observation suggests that, under the right circumstances, *Ctenosaura similis* could be an underappreciated predator capable of taking larger mammalian prey.

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