

& Larry S. Roberts' Foundations of Parasitology, McGraw Hill Higher Education, Boston, Massachusetts. 702 pp.). *Falcaustra costaricae* was described from *Anolis* (as *Norops*) *tropidolepis* from Costa Rica (Burse et al. 2004. J. Parasitol. 90:598–603). It has been reported from anurans (Goldberg and Bursey 2010. J. Nat. Hist. 44:1755–1787) and *Anolis lionotus* from Costa Rica (Burse and Brooks 2010. Comp. Parasitol. 77:232–235). The life cycle of *Falcaustra costaricae* is unknown, but it is thought that larvae may utilize invertebrates as paratenic (= transport) hosts which are infective upon ingestion by lizards (Anderson 2000. Nematode Parasites of Vertebrates: Their Development and Transmission. CABI Publishing, Oxon, UK. 650 pp.). *Anolis altae* represents a new host record for *M. panamaensis* and *F. costaricae*. Costa Rica is a new locality record for *M. panamaensis*.

We thank C. Thacker (LACM) for permission to examine *A. altae* which are part of the Costa Rica Expeditions Collection donated to LACM by J. M. Savage in 1998.

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ANOLIS CYBOTES CYBOTES (Hispaniolan Stout Anole) and ANOLIS MARRON (Jacmel Gracile Anole). PREDATION/PREY.

On 18 August 2009, at approximately 1400 h, while sampling anoles at a coastal locality near Marigot, Haiti (approximately 20 km E of Jacmel), we encountered a large adult male *Anolis c. cybotes* vertically perched with its head pointing upwards on the trunk of a coconut palm with the hindquarters of an adult female *A. marron* protruding from its mouth (Fig. 1). The *A. c. cybotes* held its ground as we moved around it and photographed it *in situ*, at one point partially extending its dewlap and doing a pushup. After photographing the *A. c. cybotes* with its prey we captured it using a noose and placed it in a cloth bag, which we subsequently stored in an empty plastic cooler inside an air-conditioned car for the remainder of the day. At some point during capture of the *A. c. cybotes*, the *A. marron* autotomized its tail, which we were not able to locate. At 2230 h (8.5 h after discovery and capture), the *A. c. cybotes* still had not fully swallowed the *A. marron* and the feet of the prey continued to protrude from its mouth. At this time, we euthanized the *A. c. cybotes*, extracted the *A. marron*, and measured, photographed, and preserved both specimens (Fig. 2). The *A. c. cybotes* measured 70 mm SVL and weighed 9.0 g. The *A. marron* measured 45 mm SVL and weighed 2.4 g. The predated anole was intact, but partially digested externally when removed from the stomach of its predator. The skin on the anterior half of the anole had been largely digested, and the skull and forelimbs of the anole showed considerable loss of structural integrity.

Although the conditions of its captivity were artificial, the fact that this large male *A. c. cybotes* failed to fully ingest the *A. marron* prey item over an 8.5 h period, and the fact that considerable digestion of the anterior portion of the *A. marron* took place over this period suggests that (1) this prey item was close to the maximum size possible for this anole, and (2) that *A. c. cybotes* may occasionally capture and eventually consume prey items that it may not fully ingest upon capture. It is possible that the progress of ingestion was correlated with the progress of digestion of the prey's anterior portion. However, it is also possible



FIG. 1. Male *Anolis cybotes cybotes* with female *A. marron* protruding from its mouth, photographed *in situ* immediately after discovery.

that these observations largely reflect the influence of the capture and containment of the predator. The *A. c. cybotes* was kept inactive at a slightly lower temperature than it was captured at, so we urge caution in interpreting its rate of digestion following capture.

Although intraguild predation events have been reported several times in *Anolis*, the sizes of the anoles involved have rarely been measured quantitatively (Gerber 1999. *Anolis Newsletter* V:28–39). This event is noteworthy in that the predator consumed a congener measuring 64.3% of its own SVL and approximately 26.7% of its own body weight (possibly more, given the lost tail and partial digestion of the *A. marron* specimen at the time of measurement). To our knowledge, this is the highest

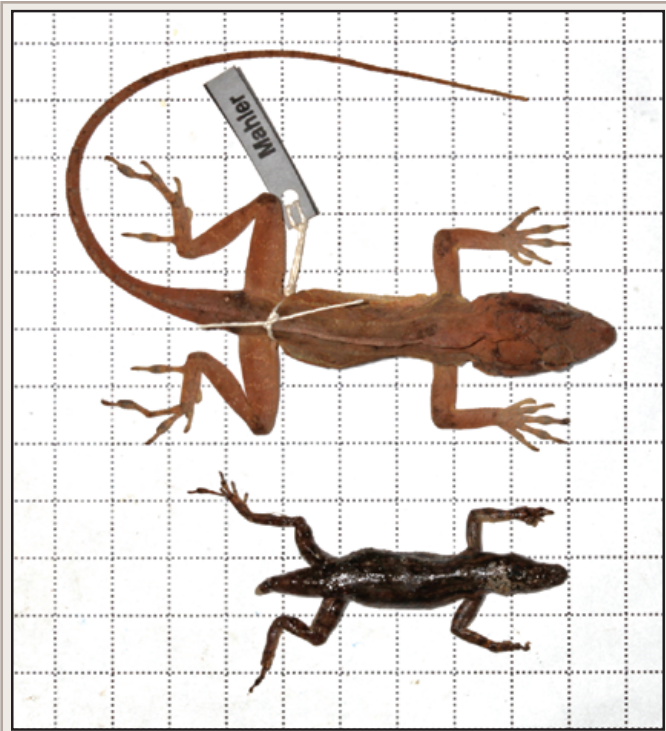


FIG. 2. Male *Anolis cybotes cybotes* (top) and female *A. marron* (bottom), immediately after the latter was extracted from the stomach and mouth of the former, but after at least 8.5 h of digestion. Grid unit = 1 cm.

prey:predator ratio quantified for anoles (Gerber 1999, *op. cit.*; Losos 2009. *Lizards in an Evolutionary Tree*. Univ. of California Press, California. 507 pp.). In experiments, *A. cybotes* is known to feed on juveniles of other anole species (e.g., *A. bahorucoensis*, *A. coelestinus*, and *A. distichus*), as well as juvenile *A. cybotes* (Fitch and Henderson 1987. *Amphibia-Reptilia* 8:69–80). Although previous natural predation of *A. cybotes* on *A. marron* has not been reported, *A. cybotes* has been documented to predate on a species closely related to *A. marron*, *A. distichus*. *Anolis marron* coexists with *A. cybotes* throughout the former species' entire range, and these two species clearly compete, often using the same food resources on a single tree (pers. obs.). This observation demonstrates that these two species interact as predator and prey as well as resource competitors.

These specimens are deposited in the Museum of Comparative Zoology at Harvard University (*A. c. cybotes* = MCZ R-188077; *A. marron* = MCZ R-188078).

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ANOLIS EQUESTRIS (Knight Anole). REPRODUCTION. *Anolis equestris* is native to Cuba and has been introduced to Florida and Oahu, Hawaii (Henderson and Powell 2009. *Natural History of West Indian Reptiles and Amphibians*. Univ. Press Florida, Gainesville. 495 pp.). Anecdotal information on reproduction is in Henderson and Powell (*op. cit.*), from Florida (Meshaka et al. 2004. *The Exotic Amphibians and Reptiles of Florida*. Krieger

Publ. Co., Malabar, Florida. 155 pp.; Meshaka and Rice 2005. *In* Meshaka and Babbitt [eds.], *Amphibians and Reptiles Status and Conservation in Florida*, pp. 225–230. Krieger Publ. Co., Malabar, Florida) and Hawaii (McKeown 1996. *A Field Guide to Reptiles and Amphibians in the Hawaiian Islands*. Diamond Head Publishing, Los Osos, California. 172 pp.). *Anolis equestris* was first noted in Oahu in 1981 (McKeown, *op. cit.*). The purpose of this note is to add to the knowledge on *A. equestris* reproduction from a histological examination of gonadal material from Hawaii.

A sample of 17 *A. equestris* from Oahu, Hawaii consisting of 10 adult males (mean SVL = 148.4 mm \pm 4.1 SD, range: 115–157 mm), five adult females (mean SVL = 143.4 mm \pm 3.9 SD, range: 140–148 mm), and two subadult females (mean SVL = 108.0 mm \pm 31.8 SD, range: 85–130 mm) from Oahu, Hawaii was examined from the Bishop Museum (BPBM), Honolulu, Hawaii, USA: BPBM:11805, 12200, 12201, 12209, 13718, 14163, 14821, 14822, 14998, 16960, 16961, 20982, 20983, 25352, 31892, 31893, 33835. *Anolis equestris* were collected 1993 to 2009.

An incision was made on the lower left lateral side of the abdomen to expose the gonads. The left testis was removed from males and the left ovary was removed from females for histological examination. Oviductal eggs and enlarged follicles (> 4 mm) were counted. Tissues were embedded in paraffin; sections were cut at 5 μ m and stained with hematoxylin followed by eosin counterstain. Histology slides are deposited in BPBM.

The only stage observed in the testicular cycle was spermiogenesis in which the lumina of the seminiferous tubules were lined by sperm or clusters of metamorphosing spermatids. Males undergoing spermiogenesis were found in the following months (sample size in parentheses): February (N = 2); April (N = 2); May (N = 4); July (N = 1); August (N = 1), indicating a prolonged period of spermiogenesis. The smallest reproductively active male (BPBM 14163) measured 115 mm SVL and was from May. The smallest reproductively active female (BPBM 16961) measured 140 mm SVL and was from April. Three adult females from April each contained oviductal eggs. In one, (BPBM 12200) the eggs were fused and could not be counted. The other two females contained evidence that consecutive clutches are produced as one of them (BPBM 11805) contained one oviductal egg and two follicles (> 4 mm) in both the right and left ovaries and the other (BPBM 16961) contained both one oviductal egg and one enlarging follicle (> 4 mm). *Anolis equestris* produces clutches of one to two eggs (Haselhaus and Schmidt 1995. *Caribbean Anoles*. T.F.H. Publ., Neptune City, New Jersey. 64 pp.). Two females (BPBM 20982, 20983) from December contained quiescent ovaries (no yolk deposition) suggesting some seasonality in the ovarian cycle of *A. equestris* in Hawaii.

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CTENOSAURA OEDIRHINA (Roatán Spiny-tailed Iguana). SAUROPHAGY. Here we report an instance of saurophagy by *Ctenosaura oedirhina* at Arch's Iguana Farm, French Harbour, Roatán, Honduras (16.3575°N, 86.44111°W). The farm is a rehabilitation center for *Iguana iguana* (Green Iguana). The *Iguana iguana* are free roaming but at an artificially high density. Wild *C. oedirhina* also occur at this site as it falls within their natural distribution, however this species is present in much lower numbers.