

supported only by its tail. The mid-section was visibly swollen with prey, but this condition did not appear to hinder mobility. The snake slowly elevated its body above the overhang. Once on top, it crawled higher on the cliff to disappear under a large sotol plant (*Dasyllirion texanum*).

While the snake was present, the swallows maintained an erratic flight pattern in front of the cliff, giving alarm calls. They did not attempt to attack the snake. Only when the snake disappeared from view did their calls stop.

Evidence of similar predatory behavior has been recorded in a specimen of *E. bairdi* collected in Brewster County, Texas (Olson 1967. Texas J. Sci. 19:99–106). Approximately 33 km SSW of Alpine, Texas, a male of the species, ca. 136 cm long, was observed resting inside two or three cliff swallow nests it had apparently broken open. While this Brewster County snake was not observed hunting and preying on the swallows, its stomach contents were examined after it was collected and found to comprise five adult cliff swallows.

Returning to this Frio River location on the same date in 2001, I found no active nests and only two or three empty nests from the previous year. However, ca. 100 m downstream, swallows had established a new nesting site that contained many nests. This downstream location had been uninhabited the year prior during the time the above incident was witnessed.

The Real County snake described here was not collected, so measurement data are unavailable. However, based on measurements of the cliff obtained with an optical laser range calculator, the length of the snake was estimated at well over 132 cm.

While *E. bairdi* is said to be chiefly “day-active” (Werler and Dixon, *op. cit.*), the incident cited above is unique in my experience for taking place during the middle of a bright, sunny day. Of the perhaps two-dozen *E. bairdi* I have observed in the last four years, all were active after dark, or just at dusk.

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EPICRATES SUBFLAVUS (Jamaican Boa). **FORAGING BEHAVIOR.** The endemic Jamaican Boa (*Epicrates subflavus*), locally known as “Yellowsnakes,” are known from three cave systems: Windsor (Trelawney), Green Grotto (St. Ann), and St. Clair (St. Catherine) (Prior and Gibson. 1997. Herpetol. Rev. 28:72–73). Bat predation has only been observed at Windsor Great Cave (Koenig and Schwartz 2003. Herpetol. Rev. 34:374–375; Vareschi and Janetzky 1998. Jamaica Nat. 5:34–35). Here we report field observations of *E. subflavus* roosting and foraging on bats in two additional cave systems in Jamaica.

We surveyed Ratbat Hole (Botany Bay, St. Thomas) on 16 December 2001 and 25 March 2002. This cave, known among local guano collectors, is about 4 km E of the satellite dish of Jamaican Communications on the main road from Kingston to Morant Bay, and can be reached after a 20-min steep hike north from Botany Bay. The main entrance is 5 m wide and about as tall, leading to a 15–20 m vertical passage. This cave is surrounded by karst, interspersed with low secondary dry scrub, and contains at least four bat species that have sharp seasonal variations in population density (Dávalos and Eriksson 2003. Caribb. J. Sci. 39:140–144). On

our first visit we found an adult *E. subflavus* on the cave entrance, with a bat in its digestive tract. During our second visit we found a *E. subflavus* foraging for bats as they emerged and thereafter, from 1830 h to 2100 h. The boa made numerous unsuccessful attempts to capture bats identical to those described by Prior and Gibson (*op. cit.*).

We visited Monarva Cave (Revival, Westmoreland) on 5 December 2001 and 21 March 2002. Monarva is a locally well-known dry passage cave in the Negril Hills and is known to harbor populations of at least seven bat species (Dávalos and Erickson, *op. cit.*). Monarva is surrounded by the hamlet of Revival, pasture fields, and secondary vegetation. On our first visit we found an adult *E. subflavus* on the cave wall, 20 m along the steep passage that funnels thousands of bats from the inner chambers to the two-meter wide cave entrance. This animal remained in the same place throughout our visit, from 1900–1945 h. On our second visit, ca. 2000 h, we found a juvenile *E. subflavus* 3 m into the cave and moving out toward the vegetation at the entrance.

These observations confirm the presence of this threatened species (Hilton-Taylor 2000. IUCN Red List of Threatened Species. IUCN, Gland. xviii + 61 pp.) in the parishes of Westmoreland and St. Thomas, where previous reports claimed they were abundant but remained unvouchered (Gibson 1996. Dodo, J. Wildl. Preserv. Trusts 32:143–155). We also add two new localities to the handful of records of *E. subflavus* in Jamaican cave systems and confirm bat predation at Ratbat Hole. The dearth of observations on the ecology of this boine and the possible threat of human intervention in these cave systems warrant further research to determine the importance of the caves for both bats and snakes.

We thank the Department of Mammalogy at the American Museum of Natural History, the Center for Environmental Research and Conservation at Columbia University, and Elizabeth R. Dumont for providing financial support for our field trips.

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EUNETES MURINUS (Green Anaconda). **SUBDUING BEHAVIOR.** Constricting snakes coil around their prey preventing the prey from breathing. Additionally, they may cause circulatory arrest in their prey by applying pressure to the thoracic cavity that prevents the prey’s heart from beating (Hardy 1994. Herpetol. Rev. 25:45–47). Here, I present evidence that when a constrictor handles potentially dangerous prey, the violence of the attack, and method of constricting might produce structural damage to the prey that reduces its ability to defend itself or escape. The following observations were taken in the Venezuelan llanos, Distrito Muñoz, Apure State (7°30’N, 69°18’W).

On 26 April 1992, a female anaconda (455 cm total length, 46 kg mass), during the process of killing a young capybara (2.5 kg mass) dislocated the capybara’s spine at the cervical level. The snake did not eat her prey because apparently other capybaras attacked her. The capybara was found floating in the river the next

day and examination of the body showed that the capybara had a dislocated spine and evidence of anaconda teeth marks on its skin, matching the size of the snake's head.

On 24 March 1992, I found a female anaconda (413.5 cm TL; 40 kg mass) that regurgitated a female white-tailed deer (*Odocoileus virginianus*) weighing 10 kg. Upon examination of the regurgitated deer, I found that it had two broken ribs. I assume that the constriction process caused the deer's ribs to break.

On 27 January 2001, a female anaconda (460 cm TL) regurgitated a full-grown male white-tailed deer (*O. virginianus*) that had a disjointed spine at the cervical level.

In May 1999, a large anaconda (ca. 450 cm TL) was observed constricting a large (ca. 180 cm TL) spectacled caiman (*Caiman crocodilus*). During the process of constriction, it was apparent because of the angle between the caiman's tail and body, that the caiman's spine was broken (Fig.1).

In a recent account, an anaconda constricted a white collared peccary (*Tayassu tajacu*) (Valderrama and Thorbjarnarson 2001. Herpetol. Rev. 32:46–47) and the authors reported that: "At some point, a muffled crackling sound was heard, resembling that of many bones breaking all at once." It is uncertain if the bones (e.g., ribs) of the peccary were actually breaking or if the sound was that of vertebrae being dislocated. The following statement by the authors: "...the snake coiled itself round the peccary's torso and squeezed, visibly stretching the peccary length-wise..." suggests the latter rather than the former.

The evidence presented here demonstrates that constriction by anacondas can produce structural damage to prey in the form of broken bones and dislocated vertebrae. Hardy (*op. cit.*) argues that the violence and pressure exerted on the prey is higher than what is needed to cause suffocation and contends that the violence and excessive pressure serves the purpose of producing circulatory arrest. While I do not disagree with Hardy's interpretation, I believe the extra pressure and violence of the strike might also serve the purpose of disjointing the spine or breaking ribs to reduce a prey's ability to escape or defend itself and to expedite death.

I thank the Wildlife Conservation Society, National Geographic Society, and Asociacion para la Conservacion y Recate Ecologico ACRE, Zoo de Doue la Fontaine-France for financial and logistic support. I also thank COVEGAN, Estación Biologica Hato El Frío,

for permits to work on their properties. I thank Tony Crocetta for providing photographic material. I am also in debt to M. Quero, P Azuaje, Mirna Quero, J. Thorbjarnarson, M. Muñoz for their cooperation in the development of this research.

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FORDONIA LEUCOBALIA (Yellow-Bellied Mangrove Snake) and **MYRON RICHARDSONII** (Richardson's Mangrove Snake). **DIURNAL FEEDING and PREY TYPE.** Snakes of the Homolopsinae, a lineage of aquatic colubrids, are found throughout southern Asia and northern Australia. Most species are piscivorous and ingest prey head first to assist digestion (Mori 1998. J. Herpetol. 32:40–50). All species in Australia are considered to be nocturnal (Gow 1989. Graeme Gow's Complete Guide to Australian Snakes. Angus and Robertson Publishers, North Ryde. 171 pp.). *Fordonia leucobalia* is reported to feed predominantly on Fiddler Crabs (*Uca* spp.), and occasionally on the Mud Lobster (*Thalassina anomala*) and shrimps (Shine 1991. Copeia 1991:120–131). Very little is documented regarding the feeding habits of *Myron richardsonii* apart from Shine (1991, *op. cit.*) who suggested it feeds on a variety of fish. We report herein several observations (MN) of these two species feeding by day in the mangroves of Ludmilla Creek, Darwin Harbour, Australia (12°25'S, 131°50'E) during 1998, with additional notes on prey consumed and methods of ingestion.

On 3 March, at ca. 1400 h, a snake (ca. 40 cm TL), identified as *F. leucobalia* according to Gow (1989, *op. cit.*), was observed within the mangrove forest. The snake was wrapped around a large male Fiddler Crab (*Uca flammula*). The snake did not consume the crab and left it alive before moving down a nearby crab burrow, perhaps as a result of being disturbed by the observer.

On 3 April, at ca. 1200 h, a *F. leucobalia* (brown dorsally and yellow ventrally) was observed on a creek bank ingesting a *T. anomala*. After ca. 10 min the snake ingested the lobster's tail, biting firmly down to displace the head, creating a clearly audible crunching sound. The snake consumed only the tail of the lobster, leaving the head in the mud.

On 13 April, at ca. 1500 h, a reddish-black *F. leucobalia* was observed within a channel ingesting a *T. anomala* as described above. On this occasion a second *F. leucobalia* (black and white morph) approached and began to coil around the first. The first snake then consumed the tail of the mud lobster as described above and moved away from the second snake rapidly.

On 2 March, at ca. 1500 h, a *M. richardsonii* was sighted on an exposed track. On close inspection, there appeared to be a black-colored nudibranch (Gastropoda) in the snake's mouth. The species could not be determined because it was almost completely encased in the snake's mouth.

The above observations report several previously undocumented phenomena. First, these observations document diurnal feeding in both *F. leucobalia* and *M. richardsonii*. Both species had been regarded as strictly nocturnal (Gow 1989, *op. cit.*). Although observed active by day throughout the year (MN, pers. obs.), feeding activities were only observed from March to April, presumably when prey are most abundant (Davis 1985. *In* Bardsley et al.



FIG. 1. Female Green Anaconda (ca. 450 cm TL) found constricting a large Spectacled Caiman (ca. 180 cm TL) in the Venezuelan Llanos. It is apparent that the spine of the caiman has been dislocated.