

positive cases of cannibalism. The stomach of one lizard (SVL 104 mm, TL 342 mm, mass = 38.92 g), collected on 12 August 1992, had one slightly digested conspecific juvenile of SVL 35 mm, ants, beetle larva, and plant materials, while that of the other cannibalistic lizard (SVL 110 mm, TL 394 mm, mass = 44.15 g), collected on 18 September 1992, contained an undigested conspecific juvenile of SVL 41 mm, a cockroach, beetles, and ants. In both cases, the juvenile lizards were swallowed whole, easily identifiable, and had only a few teeth marks on the midbody skin. The orientation of the preys' head in the distal end of the predators' stomachs indicates that the juvenile conspecifics were eaten head first.

Calotes versicolor feeds primarily on insects, but adults occasionally prey on small birds, nestlings, frogs, and geckos (Rao 1975. *British J. Herpetol.* 5(4):467-470; Sharma 1989. *J. Bombay Nat. Hist. Soc.* 88:459). The first record of intraspecific predation in *C. versicolor* was an anecdotal report of a sighting of an adult lizard (TL 330 mm, sex unknown) attacking and swallowing a subadult conspecific (Sharma 1991. *J. Bombay Nat. Hist. Soc.* 88(2):290-291). The findings of conspecific individuals in the stomach contents, a first record for the species, confirms cannibalistic behavior in this species. The low incidence (1.6%) of cannibalism indicates that intraspecific predation is incidental and probably represents opportunistic carnivory. *Calotes versicolor* is sexually dimorphic; males are larger than females. The observation that both cannibalistic lizards were males further supports the hypothesis that sexual differences in frequency of cannibalism could be related to the larger size of males (Rocha, *op. cit.*) The study was supported by a research grant SIBiol RP10/92 from the Singapore Institute of Biology.

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CTENOSAURA PECTINATA (Mexican Spiny-tailed Iguana). **PREDATION.** Ramirez-Bautista and Uribe (1992. *Herpetol. Rev.* 23:82) reported ingestion of *C. pectinata* by the snake *Trimorphodon biscutatus* in Jalisco, México. Here we report predation on this species by another snake, *Boa constrictor imperator*.

On 3 July 1993 while collecting in a tropical deciduous forest near Km 186 (México Highway 95, México-Acapulco) at 650 m elevation, we observed a *B. constrictor imperator* to fall from an *Acacia* sp. tree (2 m high). The snake was constricting a female *Ctenosaura pectinata* that had some acacia leaves in its mouth. The snake constricted the lizard at its abdominal region and was biting the lizard's right shoulder. The snake took 15 min to kill the lizard after which we collected it to prevent ingestion. The lizard (JLE00240) measured 340 mm in SVL and 1030 mm in total length. The snake measured 1600 mm total length. We released the snake at the site of capture. This is the first record of predation on *C. pectinata* by *Boa constrictor*.

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EUMECES LONGIROSTRIS (Bermuda Rock Lizard or Skink) **PREDATION.** On 5 August 1993, on Castle Island, Bermuda, we observed an adult male of the introduced Jamaican anole, *Anolis grahami* (SVL ca. 70 mm), consuming a recent hatchling of *Eumeces longirostris*, estimated SVL ca. 30-35 mm. The anole was on top of a stone wall, swallowing the skink head first, with the jaws of the anole at the level of the anterior limbs of the skink. After 2-3

minutes, the previously immobile skink writhed weakly, and was then ingested further. After the skink had been consumed to the level of the hind limbs (with feet and tail base protruding from the mouth of the anole), the anole ran from the top of the wall and was lost from view. The tail of the skink had been autotomized prior to our observations and was not found after the anole departed.

This is the first observation of reptile predation upon *E. longirostris*. It is also the first record of *Anolis* eating a skink. *Anolis grahami* is known to consume other anoles, but its diet in Bermuda consists primarily of hemipteran and hymenopteran insects (Schwartz and Henderson 1991. *Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History.* Univ. Florida Press, Gainesville, 720 pp.).

Anolis grahami was introduced to Bermuda from Jamaica in 1905 (Wingate 1966. *Herpetologica* 21:202-218). It occurs throughout Bermuda, and almost completely overlaps the range of *E. longirostris*, which is the only terrestrial vertebrate native to Bermuda, and which remains common only in a few localities, notably on the islands of Castle Harbour. Hatchling skinks appear in late July to mid-August, and even if they are uncommon prey items of *A. grahami*, predation by the anole may be a serious threat to this declining species, which is also killed by feral and domestic cats, introduced kiskadee flycatchers (Aves: Tyrannidae: *Pitangus sulphuratus*), and recently reintroduced yellow-crowned night-herons (*Nyctanassa violacea*) (Wingate, pers. obs.). A larger introduced species of *Anolis* (*A. leachi*) is well-established in Bermuda and could also be considered as a potential predator of *E. longirostris*.

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GAMBELIA SILA (Bluntnose Leopard Lizard). **CANNIBALISM.** *Gambelia sila* is a large predacious lizard of the San Joaquin Valley in California and often is the most conspicuous and behaviorally dominant local lizard species. Its chief prey by number are insects, especially orthopterans, although small lizards can account for a large portion of the mass of their diet (Montanucci 1965. *Herpetologica* 21:270-283). Adult *G. sila* are twice the length of conspecific hatchlings and weigh ten times more. Although the most common lizard prey are *Uta stansburiana*, *G. sila* are known to eat small conspecifics (Montanucci, *op. cit.*). However, no specific instances of cannibalism have been recorded. Here we report on two observations of adult *G. sila* eating hatchling conspecifics.

On the morning of 4 August 1991, we were censusing one of our plots on the Elkhorn Plain, San Luis Obispo Co., California, used to study the long-term demographics of *G. sila*. While walking the plot, we spotted an adult male (107 mm SVL, 35 g) in the open, about 100 cm from clumps of snakeweed (*Gutierrezia californica*) on a small berm of a dirt road. As we approached, it quickly snatched at the ground as a small lizard ran by. The male caught the small lizard and swallowed it, with only the tail of the captured lizard visible after a few seconds. The tail of the captured lizard extending from the mouth of the adult male was markedly banded, which is a positive identification of a hatchling *G. sila*. Tails of the other two lizards found at this site are either plain brown (*U. stansburiana*) or bright blue (hatchling *Cnemidophorus tigris*).

The second instance of cannibalism was noted on 11 August 1993, and also occurred on the Elkhorn Plain. An adult female *G. sila* (99 mm SVL, 28 g), found during surveying, had the rear legs and tail of a hatchling *G. sila* sticking out of its mouth. We use PIT tags to permanently mark *G. sila* (Germano and Williams 1993. *Herpetol. Rev.* 24:54-56.), and both lizards had PIT tags. The

hatchling was 53 mm SVL and 4.2 g when first marked 8 August 1993. We kept the female in captivity until it passed the PIT tag of the hatchling, which occurred 15 August 1993.

Peak activity periods of adult and hatchling *G. sila* usually are temporally separated. The greatest activity of yearlings and adults occurs from April to June, and some activity may occur until September (Tollestrup 1982. *Am. Midl. Nat.* 108:1–20; Germano and Williams, unpubl. data). Yet, only a small percentage of the adult population of *G. sila* remains active past July on the Elkhorn Plain, and this has occurred three times in 6 yr (Germano and Williams, unpubl. data). In contrast, *G. sila* usually hatch in late July or early August and remain active until October or early November (Tollestrup, *op. cit.*; Germano and Williams, unpubl. data). By the time hatchlings emerge from winter torpor the following spring, they are sufficiently large to escape predation by larger conspecifics. This separation of activity periods effectively minimizes impact to the hatchling population by adults, and also makes the observation of cannibalism by researchers unusual.

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SCOLOPORUS MUCRONATUS MUCRONATUS (NCN). PREDATION. This species is distributed in parts of the Mexican states of Veracruz, Hidalgo, México, Tlaxcala, Puebla, and D.F. (Alvarez and Huerta 1973. *An. Esc. Nac. Cienc. Biol. Mex.* 20:177–184) at high elevations where rocky outcrops or lava deposits provide crevice microhabitats. Natural history observations are limited to reproduction (Mendez-de la Cruz et al. 1988. *J. Herpetol.* 22:1–12) and diet (Mendez-de la Cruz et al. 1992. *Southwest. Nat.* 37:349–355).

On 25 July 1993 while collecting reptiles near km 24.5 on the Ajusco-Tianguistenco highway (Mex. Highway 892, D.F.) at an elevation of 3500 m, we collected a female *Barisia imbricata imbricata* (JLE00293, wet mass 10.0 g, SVL 98 mm) that had eaten a young *S. m. mucronatus* (SVL 30 mm). Previously we reported *S. m. mucronatus* to eat young *Barisia* at this site (Lemos-Espinal and Ballinger 1992. *Herpetol. Rev.* 23:117). This is an interesting and rarely recorded situation where syntopic lizards are mutual predators rather than competitors. Adults of *S. m. mucronatus* were common on basaltic rocks and lava at this site, whereas young were more commonly observed at the edge of basaltic rocks and areas of grass (*Festuca amolisma*) where *B. i. imbricata* was quite common (N = 57 observed). This is the first account of predation on *S. m. mucronatus* by *B. i. imbricata*.

Preserved specimen JLE00293 will be deposited in the Museum of Natural History, University of Kansas. Susana Sanoja-Sarabia kindly provided field assistance.

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SCOLOPORUS SPINOSUS SPINOSUS (NCN). BEHAVIOR. On different occasions during a three-year study of cactus wren (*Campylorhynchus brunneicapillus*) ecology in the southwestern United States and México, one of us (GHF) observed reptiles (including an unidentified colubrid snake and an unidentified

iguanaid lizard) using unoccupied nests of this bird species as diurnal refugia. The nests are large (average 19.5 cm x 16.0 cm), thick-walled, enclosed structures made primarily of grass, and frequently are maintained and used year-round as nighttime roosts. Nests are typically placed in hard-to-reach locations in spinescent vegetation. On 2 July 1991 (ca. 1530 h) in eastern Guanajuato, México, GHF observed a *Sceloporus spinosus spinosus* in a cactus wren nest located 1.5 m above ground in a 1.8-m tall cholla cactus (*Opuntia* sp.), in a sandy wash with scattered cholla, prickly pear (*Opuntia* sp.), and columnar cacti (*Cereus* sp.). The lizard, estimated to be ca. 120 mm SVL, was completely concealed inside the nest and was not collected. There was no precipitation falling at the time of this observation, but the surrounding area had received frequent rain for several weeks. Portions of the study site were flooded, and slowly moving water was observed in areas that were dry during March 1991. These observations indicate that reptile species use the arboreal nests of the cactus wren for shelter. *S. spinosus spinosus* evidently uses these nests as refugia during flooding, and nests may also provide suitable microclimates and potentially allow for predator avoidance at other times.

We thank Hobart M. Smith for encouraging us to publish this record and for identifying the *S. spinosus spinosus* from a photograph.

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SCOLOPORUS UNDULATUS CONSOBRINUS (Southern Prairie Lizard). PREDATION. On 27 July 1992, while conducting a survey of lizards of the genus *Sceloporus*, we collected an adult male *S. undulatus consobrinus* (MZFC 5337-3, 53.9 mm SVL, 121 mm TL) on a Joshua tree (*Yucca* sp.) in xerophytic habitat, 1 km SE Castaños, near Monclova, Coahuila, México, elevation 969 m. Examination of the stomach contents revealed a small portion of indeterminate material, and the head and neck of a hatchling *Cnemidophorus inornatus*, 4.6 mm head width, with the color pattern typical for this species. The anterior dorsal portion of head, which was ingested first, was crushed from snout to interparietal area, and did not show scales or skin.

Smith (1946. *Handbook of Lizards*. Comstock Publishing Associates, Ithaca, New York. 557 pp.) reported that *S. u. consobrinus* consumed beetles, ants, grasshoppers, and fragments of vegetable matter. Groves (1971. *J. Herpetol.* 5(3-4):205) reported cannibalism and predation on other non-sceloporine lizards by *S. undulatus hyacinthinus*.

Predation on teiid lizards by sceloporines was reported by Vitt and Ohmart (1974. *Herpetologica* 30(4):413); who found that *S. magister* preyed on juvenile *C. tigris*.

Ferguson et al. (1983. *In* R. B. Huey et al. (eds), *Lizard Ecology, Studies of a Model Organism*, pp. 134–148. Harvard Univ. Press., Cambridge, Massachusetts) suggested that in *S. u. garmani* aggressive behavior is due to reproductive activity associated with territoriality. We think this phenomenon is also likely for the case reported here, as the enlarged testes of the *S. u. consobrinus* suggested it was sexually active.

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