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SQUAMATA — LIZARDS

***AMEIVA AMEIVA* (Giant Ameiva). PREDATION.** *Ameiva ameiva*, a diurnal teiid lizard widely distributed across Central and South America, ranges from Panamá to Argentina (Vanzolini et al. 1980. Répteis das Caatingas, Acad. Bras. de Cienc., Rio de Janeiro; Vitt and Colli 1994. Can. J. Zool. 72:1986–2008; Sartorius et al. 1999. Biol. Cons. 90:91–101). Hawks, owls and snakes are well-known predators of *A. ameiva* (Santos and Germano 1996. Herpetol. Rev. 27:143; Tozetti et al. 2005. Herpetol. Rev. 36:443–444; Granzinolli et al. 2007. Herpetol. Rev. 38:449), but few published reports of predation by mammals exist. Rocha and Vrcibradic (1998. Cienc. e Cult. 50:364–368) reported predation by the Four-eyed Opossum (*Philander frenata*); no reports involve armadillos. Hence, we add to the predator set reported for *A. ameiva* with an observation of predation by the Nine-banded Armadillo (*Dasypus novemcinctus*).

At 2205 h on 23 October 2008, we observed a *D. novemcinctus* prey on an *A. ameiva* while traveling a dirt road near the city of Miranda, Mato Grosso do Sul, central-west Brazil (20.07833°S, 56.32444°W, datum: WGS84; elev. 177 m). The event occurred in vegetation best described as upland Pantanal savanna. As soon as we stopped the car, a *D. novemcinctus* that had just been observed crossing the road began to forage in leaf litter beneath shrubs about 5 m off the road. Within seconds, it attacked an adult male *A. ameiva* (101 mm SVL, 268 mm tail). The attack lasted less than a minute, with the armadillo killing its prey with its mouth and foreclaws. When we approached, the *D. novemcinctus* abandoned its prey and fled. Bite wounds had been inflicted to the left shoulder and the right thigh of the *A. ameiva*.

Armadillos are opportunistic, preying principally on invertebrates, but occasionally consume small vertebrates like amphibians and reptiles and other items such as plant material (Galbreath 1982. *In* J. A. Chapman and G. A. Feldhamer [eds.], Wild Mammals of North America, pp. 71–79. Johns Hopkins Univ. Press, Baltimore, Maryland). This is the first documented predation of *A. ameiva* by an armadillo.

FIG. 1. *Ameiva ameiva* being predated by nocturnally foraging Nine-banded Armadillo (*Dasypus novemcinctus*).

The *Ameiva ameiva* specimen was deposited at the Coleção Herpetológica do Museu de Zoologia da Universidade Federal da Bahia (MZUFBA–LAG1329). Jeff King and Ryan Watson provided helpful suggestions.

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***ANOLIS* SPECIES. FRUGIVORY**. Frugivory has been reported for more than 200 species of lizards (Valido and Olesen 2007. In A. J. Dennis, E. W. Schupp, R. A. Green, and D. A. Westcott [eds.], Seed Dispersal: Theory and its Application in a Changing World. CAB International), including 17 species of the genus Anolis (Herrel et al. 2004. Oecologia 140:160–168). In Puerto Rico, the consumption of fruits has been reported for two intermediate sized Anolis species, A. evermanni (Lister 1981. Ecology 62:1548–1560; Reagan 1996. In Reagan and Waide [eds.], The Food Web of a Tropical Rain Forest, pp. 321–345. Univ. of Chicago Press, Illinois) and A. monensis (Schwartz and Henderson 1991. Amphibians and Reptiles of the West Indies. University of Florida Press, Gainesville, Florida), and for the giant species A. cuvieri (Losos 1990. Carib. J. Sci. 26:65–66; Perez-Rivera 1985. Carib. J. Sci. 21:101–103). Aside from reports of seeds from stomach content analyses or fecal pellets of these three species, little is known about frugivory in Anolis from Puerto Rico. Here, we report incidental observations of frugivory for another three Anolis species of small to intermediate size.

On 5 May 1998, between 0900 and 0930 h, we observed an individual of *A. stratulus* picking and carrying away a single sweet and sticky fruit of the Wild Balsam Apple (*Momordica charantia*) in a shaded coffee plantation at the north-central part of the island. The fruits of the Wild Balsam Apple are dark yellow to orange when ripe and split open to reveal several seeds 12–16 mm long, covered with a red flesh (Acevedo-Rodríguez and Woodbury 1985. The Vines of Puerto Rico Vol. 1: 202). *Anolis stratulus* also has been reported consuming intra- and extra-floral nectar (Perry and Lazell 1997. Herpetol. Rev. 28:150–151; Ríos-López 2004. Herpetol. Rev. 35:386).

During the morning of 16 April 1999, we observed an individual *Anolis gundlachi* eating fruits of Red Palicourea (*Palicourea crocea*) at the Río Abajo State Forest in the northern kasrt region of Puerto Rico. These fruits are ovoid to globose, 4–6 mm in diameter and dark red, purple, or black (Liogier 1997. *In* Descriptive Flora of Puerto Rico and Adjacent Islands. Vol. 5. Editorial de la Universidad de Puerto Rico, San Juan, PR. 436 pp.). This same day we observed a male *A. krugi* consuming the white fruits of a stinging nettle (*Urera baccifera*). These fruits are white or pinkish, spongy, and watery (Little et al. 1974. *In* Trees of Puerto Rico and the Virgin Islands. Vol. 2. Agriculture Handbook 449. U.S. Department of Agriculture, Washington, DC. 1024 pp.). Both lizards picked the fruits and ingested them while perching in the respective plants. The report for *A. krugi* represents the first for a grass-bush anole eating fruits (Losos 2009. Lizards in an Evolutionary Tree: Ecology and Adaptive Radiation of Anoles. University of California Press, Berkeley. 507 pp.).

Body sizes, as well as ecological factors such as food limitation, low predation pressures, and high lizard densities, have been proposed to explain frugivory by lizards within insular ecosystems (see Valido and Olese, *op. cit.*; Herrel et al., *op. cit.*; Olesen and Valido 2003. Trends Rev. Ecol. Evol. 18:177–181). Our observations suggest that frugivory in small-sized lizards (size range 40–63 mm) might be of ecological importance in nature. Detailed studies are needed in order to better understand the factors that determine frugivory in *Anolis* lizards, as well as their potential role as seed dispersers. Given that *Anolis* lizards occur at high densities in Caribbean Islands, omnivory and seed dispersal by these lizards must be important in energy and mass flow as well as in the succession and regeneration of tropical forests.

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***ATLANTOLACERTA ANDREANSKYI* (Atlas Dwarf Lizard). ABNORMAL SCALATION.** In snakes and lizards, femoral glands produce secretions used for intraspecific communication. These secretions may reveal chemical information including self-recognition, conspecific discrimination, marking of territories, male dominance status, and reproductive condition (Houck 2009. Annu. Rev. Physiol. 71:161–76; Martin et al. 2007. Ecology 21:568–576). Although there have been several reports of supernumerary femoral pores in lacertid lizards (Kaliontzopoulou and Carretero 2006. Herpetol. Rev. 37:470–471), this is the first observation of total absence of femoral pores.

During an extensive survey, we studied the morphology of 142 individuals (males and females) from seven localities across the distribution of *Atlantolacerta andreanskyi*, a high-altitude endemic lacertid from the Atlas Mountains, Morocco. In this species adult males typically exhibit enlarged femoral pores when compared with other lacertids (e.g., *Podarcis*) and the two rows of femoral pores come into contact at the base of the ventral scales, while in females, as in most lacertids, they are significantly smaller (Arnold and Ovenden 2002. A Field Guide to the Reptiles and Amphibians of Britain and Europe. Ed. Collin, 288 pp.) and the two rows are not in contact (Fig. 1). Interestingly, of 70 female individuals studied, 16% had incomplete rows and 56% did not possess any femoral pores (Fig. 2), while all males surveyed exhibited a normal development of the femoral pores. This observation was common and present in all the populations. Busack (1987. Amphibia-Reptilia 8:231–236) estimated mean adult body size of this species at 41.9 mm SVL with females with oviductal eggs ranging 44–53 mm SVL (N = 8), indicating that all individuals analyzed in our study were adults. Interestingly, the median size of the females analyzed with no femoral pores (47.8 mm) was slightly larger than the females with femoral pores (44.8 mm) (Busack, *op. cit.*).

Kaliontzopoulou and Carretero (*op. cit.*) reported accessory femoral pores in one specimen of the lacertid, *Podarcis bocagei*. The authors suggested environmental stress as a cause of this abnormality because the animal was found in a cornfield where pesticides were commonly used. Because *A. andreanskyi* occurs only at altitudes above 2000 m, in widely isolated populations with limited distributions, environmental stress seems unlikely to be the cause. Instead, factors such as isolation and inbreeding might be involved, as suggested by Walker (1980. J. Herpetol 14:417–418). In Walker's (*op. cit.*) observations, the abnormalities were found in both sexes, while we found it present only in females. This fact might be due to selective pressures acting on

FIG. 1. Female specimens of *Atlantolacerta andreanskyi* from Oukaimeden, Morocco (left and right). White arrows show the femoral pores.

FIG. 2. Female specimens of *Atlantolacerta andreanskyi* from Tamelt-elt (on the left) and Tizin-Tichka (on the right), High Atlas, Morocco. The black arrows show the place were the row of femoral pores should be.

males and related to sexual selection. Femoral pore secretions produced are directly related to the levels of circulating androgens (Houck, *op. cit.*) and they have been proposed to be the basis of female mate choice, being important in individual male recognition and dominance status, and related to a higher reproductive success (Houck, *op. cit.*).

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***CERCOSAURA ARGULUS* (Elegant Eyed Lizard). ARBOREAL BEHAVIOR.** *Cercosaura argulus* is a relatively uncommon inhabitant of the Amazonian forest (Avila-Pires 1995. Zoologische Verhandelingen Leiden 299:1–706). It is most commonly encountered in leaf litter (Vitt et al. 2003. Can. J. Zool. 81:302–312), but was documented up to 1.5 m on low vegetation by Vitt et al. (*op. cit.*) and up to 2.0 m by Duellman (2005. Cusco Amazonico. Comstock Publishing Associates, Ithaca, New York. 433 pp.).

On 20 March 2011, an adult specimen of *Cercosaura argulus* was captured at approximately 2145 h on the ground during a routine quadrat search at Sachavacayoc Centre, Tambopata