Rev. 41:474), and adults, e.g., *Tomopterna cryptotis* (Wojnowski et al. 2010. Herpetol. Rev. 41:482). Sazima and Di Bernardo (1991. Mem. Inst. Butantan 53:167–173) suggested that albinism should be more frequent in nocturnal and cryptic species, but this hypothesis is difficult to evaluate in anurans (Toledo et al 2011. Herpetol. Notes 4:145–146). The specimen was deposited in the herpetological collection of Museu de Ciências Naturais da Pontifícia Universidade Católica de Minas Gerais (MCNAM 15022), Belo Horizonte, Minas Gerais, Brazil.

RONALD R. CARVALHO JR. (e-mail: ronald.sapiens@gmail.com), **SARA RODRIGUES ARAÚJO** (e-mail: sarararaujo@yahoo.com.br), and **LIBIA KENIA PEREIRA** (e-mail: libiajp@hotmail.com), Sapiens Soluções Ambientais Ltda, 30220-260, Belo Horizonte, Minas Gerais, Brazil.

***RHINELLA GRANULOSA* (Common Lesser Toad), *XENODON MERREMII*. PREDATION.** Anurans are important prey for numerous taxa, and are predated in all life stages from eggs to adults (Duellman and Trueb 1994. Biology of Amphibians. Johns Hopkins University Press, Baltimore, Maryland. 670 pp.; Wells 2007. The Ecology and Behavior of Amphibians. Univ. Chicago Press, Chicago, Illinois. 1148 pp.). Toads from the genus *Bufo* (= *Rhinella*) are described as the preferred prey of *Xenodon merremii*, which is immune to their cutaneous toxins (Vanzolini et al. 1980. Pap. Avul. Zool. 34:1–9). This diurnal snake is widely distributed in South America, occurring from the Guianas to Argentina, mainly in open areas (Hoogmoed 1985. Zool. Meded. 8:79–88; Marques et al. 2001. Serpentes da Mata Atlântica - Guia Ilustrado. Editora Holos. Ribeirão Preto, São Paulo. 184 pp.; Vanzolini et al. 1980, *op. cit.*). *Rhinella granulosa* is distributed in northeastern Brazil, predominantly in the Caatinga domain, in the states of Minas Gerais, Bahia, Espírito Santo, Alagoas, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe (Narvaes and Rodrigues 2009. Arq. Zool. 40[1]:1–7). Here we report predation of an adult *R. granulosa* by *X. merremii*.

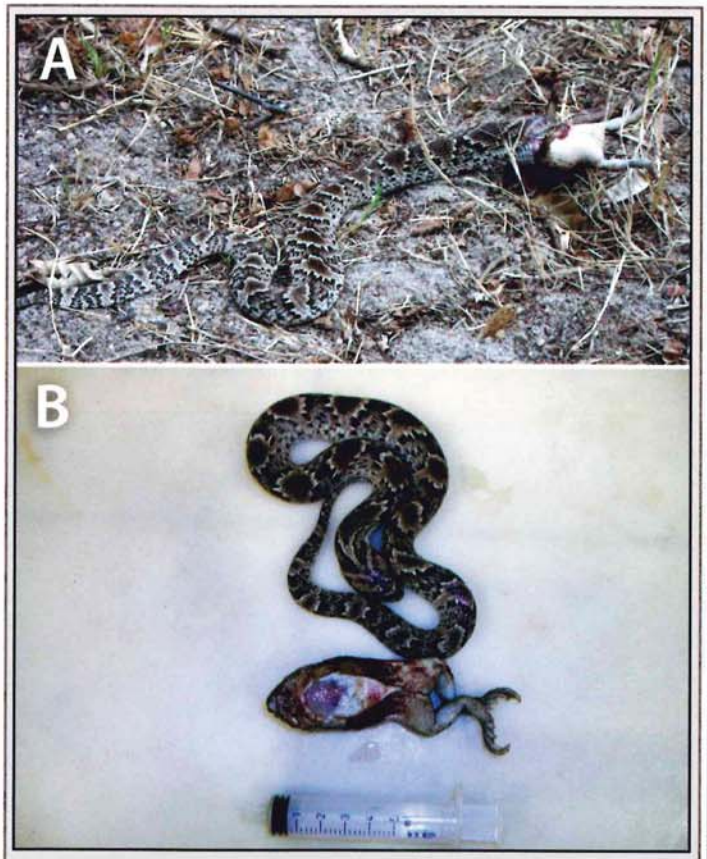

FIG. 1. A) Adult *Rhinella granulosa* being predated by an adult *Xenodon merremii*, in a fragment of the Atlantic Forest in the municipality of Macaíba, Rio Grande do Norte state, Brazil; B) View of the snake and toad after regurgitation.

On 21 Aug 2011 at ca. 1500 h, at Mata do Olho D'água in the municipality of Macaíba in Rio Grande do Norte, Brazil (93.24142°N, 224.8828°W, WGS84; elev. 40 m), we observed a *X. merremii* on the edge of a trail, under direct sunlight on exposed soil. This snake grabbed a *R. granulosa* by its forelimbs with the ventral region facing upwards (Fig. 1). After the snake totally consumed its prey, both were collected and taken to the laboratory and deposited together in the Herpetological Collection of the Department of Botany, Ecology and Zoology at the Federal University of Rio Grande do Norte, Brazil (CHBEZ 3779). This is the first report of the predation of *R. granulosa* by *X. merremii* in the Northeastern Atlantic Forest.

MATHEUS MEIRA RIBEIRO (e-mail: matheusbiologia@gmail.com), and **ELIZA MARIA XAVIER FREIRE** (e-mail: elizajuju@ufrnet.br), Laboratório de Herpetologia, Departamento de Botânica, Ecologia e Zoologia, Centro de Biociências, Universidade Federal do Rio Grande do Norte, Campus Universitário, Lagoa Nova, 59072–970, Natal, Rio Grande do Norte, Brazil.

***RHINELLA JIMI* (Cururu Toad). DIET.** *Rhinella jimi* is a euryphagous toad that feeds on centipedes, insects, spiders, frog, small snakes, small rodents, and bats (Gouveia et al. 2009. Herpetol. Rev. 40:210; Peña et al. 1996. Rev. Biol. Trop. 19[5]:702; Santos et al. 2010. Biotemas 23[2]:215–218). On 10 May 2011 at 1830 h we captured an adult *Rhinella jimi* (143.5 mm SVL; 340.0 g after prey removal) in Área do Horto Florestal Olho D´água da Bica (6.5°S, 36.73°W, WGS84; 667 m elev.), City of Cuité, Paraíba, Brazil. Upon dissection, we found a *Rhinella granulosa* (37.0 mm SVL, 5.1 g) in the *R. jimi* stomach; the prey had been ingested head-first. Small frogs are infrequent in the diet of adult *R. jimi* (Peña et al. 1996, *op. cit.*). This is the first report of *R. granulosa* in the diet of *R. jimi*. The frogs were deposited in the Herpetological Collection of the Paleoherpetological and Herpetological Laboratory of the Universidade Federal Rural de Pernambuco - UFRPE, Recife, Brazil (CHPUFRPE 979 *R. jimi* and CHPUFRPE 980 *R. granulosa*). This research was authorized by the ICMBio, permit number 23024-1.

MÁRCIO FRAZÃO CHAVES (e-mail: marciochaves@ufcg.edu.br) and **JEAN CARLOS DANTAS DE OLIVEIRA** (e-mail: jeancarlosdo@hotmail.com), Universidade de Campina Grande, UFCG, Campus de Cuité, Centro de Educação e Saúde, s/n, CEP: 58175-000, Cuité, PB, Brazil; **GERALDO JORGE BARBOSA DE MOURA,** Universidade Federal Rural de Pernambuco, Paleoherpetological and Herpetological Laboratory, UFRPE, Rua Dom Manoel de Medeiros, Dois Irmãos - CEP: 52171-900, Recife, PE, Brazil (e-mail: geraldojbm@yahoo.com.br).

***RHINELLA MARINA* (Cane Toad). DIET.** *Rhinella marina* is an opportunistic predator that "will apparently eat almost every animate object it can catch" (Zug and Zug 1979. Smithson. Contr. Zool. 284:1–58). In both its native and introduced range, the diet of non-larval *R. marina* is primarily composed of a wide range of terrestrial invertebrates (Lever 2001. The Cane Toad. The History and Ecology of a Successful Colonist. Westbury Academic and Scientific Publishing, Otley, U.K.), especially beetles, ants, and termites (Murray and Lampo 1996. J. Herpetol. 30:73–76; Strüssmann et al. 1984. J. Herpetol. 18:138–146; Zug and Zug 1979, *op. cit.*). Except for the consumption of smaller conspecifics

(Pizzatto and Shine 2008. Behav. Ecol. Sociobiol. 63:123–133), and the suggestion that Cane Toads actively prey on chicks of Australian ground-nesting bee-eaters (Boland 2004. Biol. Conserv. 120:53–62, but see opposing results in Beckmann 2011. Impacts of the Invasive Cane Toad on Australia's Native Birds. PhD thesis, Univ. Sydney, Sydney), there are few cases reporting small vertebrates in the stomach contents of *R. marina*.

During the course of our studies on *R. marina* in tropical northern Australia we recorded 10 *Ramphotyphlops* sp. (Typhlopidae) in the guts or feces of ten individual toads (Table 1, Fig. 1). The snakes were identified by L. Pizzatto and R. Somaweera using Cogger (1992. Reptiles and Amphibians of Australia, 5th ed. Reed Books, Chatswood, NSW, Australia) as a guide. Specimens that were preserved in ethanol were deposited in the Museum and Art Gallery of the Northern Territory, in Darwin. Our results show that toads in northern Australia consume native *Ramphotyphlops unguirostris* and *R. guentheri* and introduced *R. braminus*. However the frequency of predation of blindsnakes by Cane Toads may be trivial (only 0.6% of the dissected Cane Toads from Lake Argyle contained blindsnakes). The 10 records reported herein are out of > 3,000 Cane Toads collected between 2008 and 2011 that we have dissected to examine gut contents or collected and kept overnight for other studies.

In the Philippines, snakes of the genus *Typhlops* were also found in very low numbers in the stomach contents of *R. marina* (19 out of ca. 5,000 stomachs examined; Rabor 1952. Copeia 1952:281–282). Most of our records of Cane Toads ingesting typhlopids occurred during the wet season (December to April) or early dry season (May), possibly as a result of flooding which induces fossorial snakes to move to the soil surface, rendering them susceptible to predation. In record 10 (Table 1), an entire, undigested *R. braminus* was found in the intestine of a Cane Toad, and in two other cases (records 1 and 3, Table 1) undigested *R. braminus* and *R. guentheri* were found in the feces. We speculate that these burrowing snakes were probably ingested alive, moved through the toad stomach, and found their way to the intestines, where they died from anoxia rather than succumbing to the toad's digestive secretions. The predominance of the exotic *R. braminus* in our samples might reflect local abundance, the relatively smaller body size facilitating consumption, or perhaps specific behavior that facilitates predation.

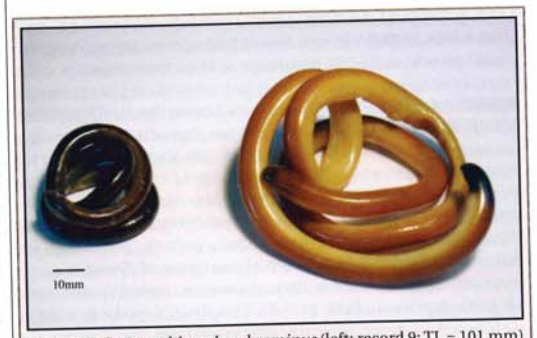

FIG. 1. Whole *Ramphlotyplops braminus* (left; record 9: TL = 101 mm) and *R. guentheri* (right; record 3: TL = 225 mm), recovered from the intestines and feces of Cane Toads (*Rhinella marina*) in northern Australia.

TABLE 1. Typhlopid snakes preyed on by Cane Toads (*Rhinella marina*) in northern Australia. TL = total length, SUL = snout–urostyle vent. NT = Northern Territory, WA = Western Australia.

# Record	Date	Prey species	Prey TL	Location	Comment	Toad SUL	Toad sex
1	28 Feb 2009	*Ramphotyphlops braminus*	94	Darwin, NT 12°24'S, 130°51'E	In feces recovered from calico bag in which toads were kept overnight	—	—
2	2 Mar 2009	Unidentified typhlopid	105	Adelaide River, NT 12°14'S, 130°06'E	In the stomach; snake head was digested	147.2 (without the head)	F
3	4 Mar 2009	*R. guentheri*	225	Beatrice Hill, NT 12°37'S, 131°18'E	As for #1 (Fig. 1)	—	—
4	Nov 2009	*R. braminus*	108	Palmerston, NT 12°30'S, 130°59'E	In the stomach of a road-killed toad	90	M
5	12 Feb 2010	*R. guentheri*	76	Mary River National Park, NT 12°54'S, 130°39'E	Regurgitated live	80	M
6	24 Feb 2010	*R. braminus*	105	Palmerston, NT 12°29'12"S, 130°57'59"E	In the stomach; snake head was partially digested	105.7 (without the head)	M
7-8	Nov 2010	2 unidentified typhlopids	—	Eastern Lake Argyle, WA 16°29'S, 128°75'E	In the intestines of 2 out of 314 toads from same locality; partially digested	104.7, 122.6	F, F
9	Apr 2011	*R. unguirostris*	212	Kununurra, WA 15°39'S, 128°42'E	Regurgitated live	120	F
10	2 May 2011	*R. braminus*	101	Middle Point, NT 12°34'S, 130°18'E	In the intestine (Fig. 1)	123	F

LIGIA PIZZATTO (e-mail: ligia.oceanica@gmail.com), **RUCHIRA SOMAWEERA** (e-mail: ruchira.somaweera@gmail.com), **CRYSTAL KELEHEAR** (e-mail: crystal.kelehear@hotmail.com), and **GREGORY P. BROWN** (e-mail: gp_brown@bigpond.com), School of Biological Sciences A08, University of Sydney, Sydney, NSW 2006, Australia.

***RHINELLA MARINA* (Cane Toad). CROCODILE PREDATION.** *Rhinella marina* has had great success in invading new habitats and is considered one of the world's top 100 most invasive species. There are few recorded successful predators of the large, highly toxic adults in its introduced range. Because *R. marina* possess large parotid glands that produce bufotoxins, toxic skin secretions which cause cardiac distress when consumed, it is assumed that few potential predators can safely consume the adult toads (Toledo and Jared 1995. Comp. Biochem. Physiol. A. 111:1–29). There are limited reports of successful predators of adult and large juvenile *R. marina* in the toad's native range of Central and South America (Zug and Zug 1979. Smithson. Contr. Zool. 284:1–58). In Australia, where introduced *R. marina* has attained particularly high adult densities, populations of reptilian anurophagous predators have experienced notable declines (Shine 2010. Q. Rev. Biol. 85:253–291). While some native Australian snake species have begun to evolve morphologies that prevent the ingestion of *R. marina* (Phillips and Shine 2004. Proc. Natl. Acad. Sci. USA 101:17150–17155), Freshwater Crocodiles (*Crocodylus johnstoni*) continue to be negatively affected by *R. marina* consumption (Letnic et al. 2008. Biol. Conserv. 141:1773–1782). Herein we provide evidence that the American Crocodile (*Crocodylus acutus*) found in the native range of *R. marina* is an active predator of adult *R. marina*.

In late June through early July 2011, we observed two juvenile *C. acutus* (~1 m long) around a pond in the Santa Cruz area of Gamboa, Panama. These juveniles were consistently observed around the same pond three to four nights a week for two weeks. On the evening of 1 July 2011, we observed one of the juvenile *C. acutus* with an adult male *R. marina* in its mouth (Fig. 1). Although the fate of the toad is unknown, we did not locate the body of the dead toad on the following day and assume that it

FIG. 1. Juvenile *Crocodylus acutus* with an adult male *Rhinella marina* in its mouth. Photo taken on the evening of 1 July 2011 in the Santa Cruz area of Gamboa, Panama.