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RHINELLA MIRANDARIBEIROI. PREDATION. *Rhinella mirandaribeiroi* is a medium-sized bufonid belonging to the *R. granulosa* group found in the Cerrado Biome and in Cerrado enclaves in the Amazon (Narvaes and Rodrigues 2009. *Arq. Zool.* 40:1–73). Here, we report predation of *R. mirandaribeiroi* by *Leptodeira annulata* (Banded Cat-eyed Snake; Fig. 1). At 2050 h on 15 August 2014, in a remnant of cerrado vegetation within a rock outcrop in the municipality of Iporá, state of Goiás, Brazil (16.45175°S, 51.38838°W, WGS 84; 460 m elev.), we observed an individual of *R. mirandaribeiroi* being consumed by *L. annulata* (Fig. 1). Intake of the prey started from the head and the ingestion process lasted approximately 15 min. This is the first record of *R. mirandaribeiroi* being preyed by *L. annulata*. This record contributes to the increase of knowledge about the potential predators of this species, as well for the diet of *L. annulata*.



FIG. 1. *Rhinella mirandaribeiroi* being preyed upon by *Leptodeira annulata*.

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RHINELLA MARINA (Cane Toad). PREDATION BY A CROCODILE. The invasive *Rhinella marina* has been introduced to many countries and islands worldwide (Lever 2001. *The Cane Toad. The History and Ecology of a Successful Colonist.* Westbury Academic and Scientific Publishing, Otley, UK. 230 pp.), including the Philippines where it was introduced as a biological pest control agent in the 1930s (Merino 1936. *Philipp. J. Agric.* 7:283–286). *Rhinella marina* has large parotid glands that produce bufotoxins, which can cause cardiac distress when consumed; therefore, it is assumed that few predators can safely consume adult *R. marina* (Toledo and Jared 1995. *Comp. Biochem. Physiol.* A 111:1–29), especially in newly *R. marina*-invaded habitat.

In Australia, the interaction between the *R. marina* invasion and crocodilian populations is extensively studied. In some locations, *Crocodylus johnstoni* (Freshwater Crocodile) populations displayed mass mortalities after *R. marina* invaded their habitat (e.g., Letnic et al. 2008. *Biol. Conserv.* 141:1773–1782; Britton et al. 2013. *Wildl. Res.* 40:312–317). In contrast, negligible impacts were observed in other populations (Doody et al. 2009. *Anim.*



FIG. 1. A juvenile *Crocodylus mindorensis* with an individual *Rhinella marina* in its mouth, grasping it by the head and parotid glands.

Conserv. 12:46–53; Somaweera and Shine 2012. *Anim. Conserv.* 15:152–163). In line with the latter, *C. porosus* (Estuarine Crocodile) has shown tolerance towards *R. marina* ingestion (Smith and Phillips 2006. *Pac. Conserv. Biol.* 12:40–49). Previous studies indicate that predator size may play a substantial role in *R. marina* tolerance (Smith and Phillips 2006, *op. cit.*), with intermediate-sized (0.6–1.5 m) crocodiles most at risk (Letnic et al. 2008, *op. cit.*; Britton et al. 2013, *op. cit.*). Here, we suggest that some individuals of the relatively small, critically endangered *C. mindorensis* (Philippine Crocodile) may prey on introduced *R. marina* without ill effects.

The Mabuwaya Foundation regularly monitors breeding sites of *C. mindorensis* in the Sierra Madre mountain range on Luzon, the Philippines, since 2001 (van Weerd and van der Ploeg 2012. *The Philippine Crocodile: Ecology, Culture and Conservation.* Mabuwaya Foundation, Cabagan, Philippines. 152 pp.). All these sites are located in human-dominated landscapes and have been colonized by *R. marina*, which occurs in high densities (pers. obs.) and is the only member of the Bufonidae on Luzon (Diesmos et al. 2015. *Proc. California Acad. Sci.* 62:457–539; Brown et al. 2013. *ZooKeys* 266:1–120). One of the sites is Dinang Creek, a small tributary to the Ilaguen River with a narrow riparian forest zone (ca. 2–5 m) and otherwise surrounded by agricultural lands and grassland. In 2010, a juvenile *C. mindorensis* (intermediate-sized, ca. 1 m total length) was observed mouthing an adult *R. marina* (Fig. 1) in Dinang Creek in the municipality of San Mariano (16.79329°N, 122.04489°E; WGS84). It is unknown whether the crocodile consumed the toad. However, it is suggested that some *C. johnstoni* die from just mouthing *R. marina* (Somaweera et al. 2013. *Anim. Conserv.* 16:86–96). Neither a deceased toad nor crocodile were found in the subsequent two days, which suggests that the *C. mindorensis* killed and consumed the *R. marina* without ill effects. In all surveys and at all survey sites, no *C. mindorensis* mortality without human interference was recorded even though *R. marina* is common in these sites.

Our observation of an intermediate-sized *C. mindorensis* mouthing a *R. marina* with no observed ill effects suggests some individuals are tolerant to bufotoxin but we do not know how variable this tolerance is between individuals and how that might translate to tolerance at the population level. Coevolution with other bufonids may have resulted in bufotoxin tolerance.

Crocodylus mindorensis overlaps in distribution with native toads in Mindanao and Calauit Island (Diesmos et al. 2015, *op. cit.*), although the latter population is likely introduced from the Visayas (Tabora et al. 2012. *Zootaxa* 3560:1–31). Luzon Island, however, does not have any native toad species (Diesmos et al. 2015, *op. cit.*). If bufotoxin tolerance has evolved in *C. mindorensis* in Mindanao, this trait could have spread throughout the Philippines when the *C. mindorensis* population was still large and contiguous (van Weerd and van der Ploeg 2012, *op. cit.*).

The potential resistance to bufotoxin of *C. mindorensis* deserves further study, due to the possibility of heterogeneity of bufotoxin tolerance between and within populations, as is shown in *C. johnstoni* (Somaweera et al. 2013, *op. cit.*). However, no crocodylian mass mortality was recorded in relation to the range expansion of *R. marina* in the Philippines. Nevertheless, *C. mindorensis* remains severely threatened by anthropogenic impacts such as hunting and habitat loss (van Weerd and van der Ploeg 2012, *op. cit.*).

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TRACHYCEPHALUS MESOPHAEUS (Golden-eyed Treefrog).

MICROHABITAT. *Trachycephalus mesophaeus* is an endemic species of the Atlantic Forest of Brazil and is generally associated with vegetation around temporary and permanent bodies of water (Haddad et al. 2013. *Guia Dos Anfíbios da Mata Atlântica - Diversidade e Biologia*. Anolis Books, São Paulo. 544 pp.), including inside bromeliads. Their eggs are deposited on the surface of temporary and permanent bodies of water (Prado et al. 2003. *Bol. Mus. Nac., N.S., Zool.* 510:1–11). Here we describe an observation of *T. mesophaeus* using the pitcher of the plant *Nepenthes ventricosa*, in a plant nursery greenhouse in the Atlantic Forest, Juquitiba, São Paulo, Brazil (23.54490°S, 46.59230°W; WGS 84). At 1200 h on 12 December 2017, a *T. mesophaeus* (SVL = 5 cm) was observed for the first time in a *Nepenthes* pitcher (opening = 4 cm, length = 14.4 cm; Fig. 1). Every time we approached, it retreated into the pitcher, with half of the body submerged. The liquid of the pitcher was full of dead invertebrates, and when the *T. mesophaeus* moved, there was a smell of decaying animals. The *T. mesophaeus* was seen in the pitcher for five days, and was last seen at 1340 h on 19 December 2017.

Carnivorous plants of the genus *Nepenthes* have leaves modified into pitchers. In the operculum (pitcher hood) there is a liquid used to attract vertebrates and invertebrates. The pitcher also contains liquid, which is responsible for digesting prey, however, these liquids are not able to kill all organisms and some animals use the pitcher as temporary or permanent habitat and for breeding (Adlassnig et al. 2010. *Annal. Bot.* 107:181–194). *Nepenthes ventricosa* is indigenous to the Philippines and lives in tropical forests, and can be found for sale in nurseries in Brazil. Some animals (e.g., amphibians) that use pitchers of carnivorous plants are opportunistic and can take advantage of the amount of prey attracted by the plant as a food source (Adlassnig et al. 2010, *op. cit.*). We did not observe the *T. mesophaeus* feeding, and instead we assume it was using the pitcher as a diurnal retreat.



FIG. 1. *Trachycephalus mesophaeus* inside the pitcher of *Nepenthes ventricosa*.

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TESTUDINES — TURTLES

CHELODINA BURRUNGANDJII (Sandstone Snake-Necked Turtle). **MAXIMUM SIZE.** *Chelodina burrungandjii* is a medium-sized, long-necked chelid turtle native to tropical northern Australia, where it inhabits lotic waters and associated pools in



FIG. 1. Largest specimens of *Chelodina burrungandjii* on record.