Predation of *Ameiva ameiva* (Squamata: Teiidae) by *Caracara plancus*, with a review of predators in Brazil

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Observations on predation in nature are relevant because they provide key information regarding diet and natural history of species. Such observations are difficult to obtain in systematic surveys and most records came from occasional observations. Furthermore, this type of documentation contributes substantially to a better understanding of ecosystem dynamics, since predation has important consequences in the organization of biological communities (Law & Blackford, 1992; Brook et al., 2012).

Neotropical lizards are recognized as a food source for many animal groups such as anurans, snakes, other lizards, birds, mammals and even invertebrates (see Pianka & Vitt, 2006; Schalk & Cove, 2018). *Ameiva ameiva* (Linnaeus, 1758) is a diurnal species with one of the widest geographic distributions among Neotropical lizards (Harvey et al., 2012). In Brazil, it is one of the most conspicuous and abundant members of lizard assemblages, occurring in rural areas, forest edges and in areas of forest fragmentation (Vitt & Colli, 1994), which suggests an increase in its abundance in these localities, which influence the prey-predator relationship.

The Crested Carcara, *Caracara plancus* (Miller, 1777) is a Falconidae that avoids forest interiors, but can be found in many habitats, including forest edges, open fields, natural grasslands, shrub-

lands, marshes, pastures, wetlands, and agricultural areas. Unlike most falcons, it is typically described as an opportunistic predator, feeding even on road-killed animals and carrion (Okada-Aguiar & Costa-Campos, 2018) and many live prey such as mammals, birds (and their nestlings), reptiles, and large insects (Vargas et al., 2007). Herein, we report a case of predation on *A. ameiva* by *C. plancus* in northern Brazil. We also provide a brief review of predatory events in *A. ameiv*a.

The event was observed on 30 April 2022 at 14:00 h, during a bird survey in a rural area (2.700°S, 54.950°W, datum WGS84, elevation 169 meters a.s.l.) located in the municipality of Belterra, state of Pará, east-central Amazonia, Brazil. One of us (EVL) noticed the *C. plancus* capturing a prey on the ground, in an open area, about two meters from the forest edge (Fig. 1). A few seconds later, the caracara flew up towards a tree 15 m high, in the edge of the forest, where it ate the lizard's head before flying into the forest fragment (Fig. 2). These observations lasted ca. five minutes.

Although the saurophagy by *C. plancus* has been recorded from pellets (Vargas et al., 2007), documentation of predation upon lizards in nature is scarce given the difficulty of recording these events in the wild (Bernarde et al., 2016). Many studies have documented *A. ameiva* as prey for vertebrates and invertebrates (Table 1). We conducted a literature survey on Google scholar using several key word combinations regarding predation on *A. ameiva*: diet OR natural history OR predator OR predation OR prey OR predator–prey OR vertebrates OR invertebrates AND "*Ameiva ameiva*". In addition, we searched editions of the journal Herpetological Review (1996–2022), which traditionally publishes natural history notes. Non-peer-reviewed literature (theses and conference abstracts) was not included. We considered only records from Brazil. Species nomenclature follows the lists of Brazilian amphibians and reptiles by Segalla et al. (2021) and Costa et al. (2021), respectively.

We found 3330 results, with 40 being relevant to this study because they present records of predation on *A. ameiva* (18 articles and 22 natural history notes, see Table 1). The most common group of animals reported as predators of *A. ameiva* are snakes, represented by 27 species from five families (Boidae, Colubridae, Dipsadidae, Elapidae, and Viperidae). Birds (9 species) are the second most numerous group that feeds on this species, followed by mammals (7 spp.), lizards (3 spp.), amphibians (1 spp.) and crustaceans (1 sp.) (Table 1).

It is likely that there are more predation events on *A. ameiva* than reported, given its wide distribution and sym-

patry with several potential predator species. However, the difficulty in recording such events makes it difficult to accurately ascertain the true extent of the diversity of predators that feed on this species of lizard. Therefore, our findings expand the knowledge on natural history of *Ameiva ameiva* through identification of its natural predator, and of *C. plancus* by adding a lizard species to its list of consumed prey species. We encourage observers to make this type of record public on online platforms such as WikiAves (*https://www.wikiaves.com.br/*), eBird (*https://ebird.org/home*), Fonoteca Neotropical Jacques Vielliard (*https://www2.ib.unicamp.br/fnjv/*) and iNaturalist (*https://www.inaturalist.org/*) so that they can be used to understand the natural history of the species.

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Figure 1. Predation of Ameiva ameiva by *Caracara plancus* in Belterra, state of Pará, Brazil. Photo by Edson Lopes.

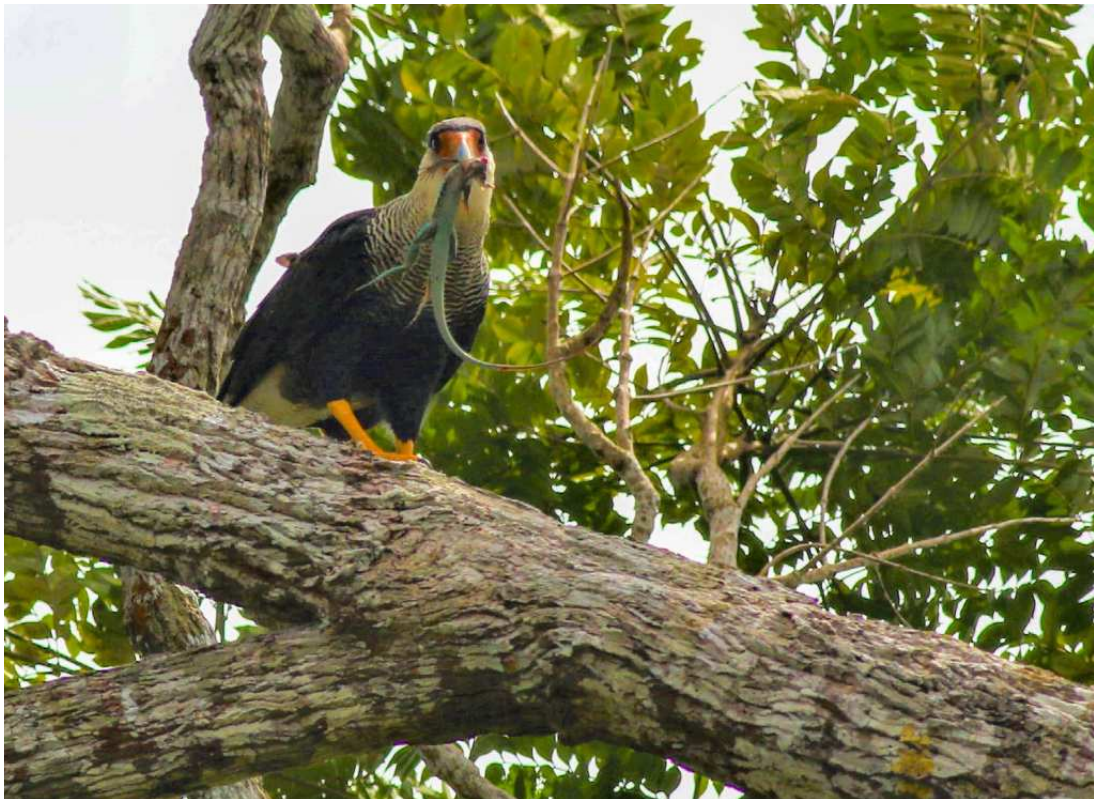

Figure 2. *Caracara plancus* holding *Ameiva ameiva* specimen on a tree, state of Pará, Brazil. Photo by Edson Lopes.

Table 1. Predation records upon *Ameiva ameiva* in Brazil.

Predator	**References**
CRUSTACEA	
Ocypodidae	
Ocypode quadrata (Fabricius, 1787)	(Segadilha et al., 2016)
ANURA	
Leptodactylidae	
Leptodactylus labyrinthicus (Spix, 1824)	(Vaz-Silva et al., 2003)
SQUAMATA	
"LIZARDS"	
Teiidae	
Salvator merianae Duméril & Bibron, 1839	(Silva et al., 2014)
Tupinambis teguixin (Linnaeus, 1758)	(Ávila-Pires, 1995)
Tropiduridae	
Tropidurus hispidus (Spix, 1825)	(Rodrigues et al., 2014)
SERPERNTES	
Boidae	
Boa constrictor Linnaeus, 1758	(Ávila-Pires, 1995; Pizzatto et al., 2009; Bernarde & Abe, 2010; Silva et al., 2016)
Corallus hortulana (Linnaeus, 1758)	(Pizzatto et al., 2009)
Epicrates assisi Machado, 1945	(Vitt & Vangilder, 1983)
Colubridae	
Drymarchon corais (Boie, 1827)	(Ávila-Pires, 1995; Bernarde & Abe, 2010)
Drymoluber dichrous (Peters, 1863)	(Ávila-Pires, 1995)
Mastigodryas boddaerti (Sentzen, 1796)	(Ávila-Pires, 1995; Bernarde & Abe, 2010)
Oxybelis aeneus (Wagler in Spix, 1824)	(Beebe, 1946; Ávila-Pires, 1995)
Oxybelis fulgidus (Daudin, 1803)	(Fischer & Gascon, 1996; Almeida et al., 2020)

Dipsadidae	
Clelia clelia (Daudin, 1803)	(Ávila-Pires, 1995)
Erythrolamprus aesculapii (Linnaeus, 1766)	(Santos & Vaz-Silva, 2012)
Erythrolamprus poecilogyrus (Wied, 1824)	(Michaud & Dixon, 1989)
Oxyrhopus melanogenys (Tschudi, 1845)	(Bernarde & Abe, 2010)
Oxyrhopus trigeminus Duméril, Bibron & Duméril, 1854	(Vitt & Vangilder, 1983; França et al., 2008; Alencar et al., 2012)
Philodryas aestiva (Duméril, Bibron & Duméril, 1854)	(França et al., 2008)
Philodryas nattereri Steindachner, 1870	(Vitt, 1980; Vitt & Vangilder, 1983; Mesquita et al., 2011)
Philodryas olfersii (Liechtenstein, 1823)	(Vitt, 1980; França et al., 2008; Mesquita et al., 2013; Lauvers et al., 2016)
Pseudablabes patagoniensis (Girard, 1858)	(França et al., 2008; Laurindo et al., 2010)
Pseudoboa coronata Schneider, 1801	(Ávila-Pires, 1995)
Pseudoboa haasi (Boettger, 1905)	(Ávila & Ferreira, 2006)
Pseudoboa neuwiedii (Duméril, Bibron & Duméril, 1854)	(Ávila & Ferreira, 2006)
Pseudoboa nigra (Duméril, Bibron & Duméril, 1854)	(Ávila & Ferreira, 2006; Rodrigues et al., 2016)
Siphlophis compressus (Daudin, 1803)	(Ávila-Pires, 1995)
Xenodon severus (Linnaeus, 1758)	(Ávila-Pires, 1995)
Elapidae	
Micrurus frontalis (Duméril, Bibron & Duméril, 1854)	(Maffei et al., 2009)
Viperidae	
Bothrops atrox (Linnaeus, 1758)	(Ávila-Pires, 1995)
Bothrops moojeni Hoge, 1966	(Pontes et al., 2018)
Crotalus durissus Linnaeus, 1758	(Santos & Germano, 1996)

AVES	
Accipitridae	
Buteo albicaudatus (Vieillot, 1816)	(Granzinolli et al., 2007)
Buteo nitidus (Latham, 1790)	(Gaiotti et al., 2011)
Gampsonyx swainsonii Vigors, 1825	(Pinho et al., 2010)
Heterospizias meridionalis (Latham, 1790)	(Ávila-Pires, 1995)
Rupornis magnirostris (Gmelin, 1788)	(Ávila-Pires, 1995)
Ardeidae	
Ardea alba Linnaeus, 1758	(Pommer-Barbosa et al., 2021)
Tigrisoma lineatum (Boddaert, 1783)	(Mônico et al., 2016)
Falconidae	
Caracara plancus (Miller, 1777)	**This study**
Falco femoralis Temminck, 1822	(Cotts et al., 2019)
Falco sparverius Linnaeus, 1758	(Goulart et al., 2019)
Strigidae	
Athene cunicularia (Molina, 1782)	(Tozetti et al., 2005)
MAMMALIA	
Carnivora	
Canidae	
Cerdocyon thous Linnaeus, 1766	(Gatti et al., 2006)
Felidae	
Leopardus pardalis (Linnaeus, 1758)	(Branco et al., 2019)
Leopardus wiedii (Schinz, 1821)	(Teixeira et al., 2015)
Mustelidae	
Galictis vittata (Schreber, 1776)	(Yensen & Tarifa, 2003)
Procyonidae	
Nasua nasua (Linnaeus, 1766)	(Aoki et al., 2011)
CINGULATA	

Dasypodidae	
Dasypus novemcinctus Linnaeus, 1758	(Filadelfo et al., 2011)
DIDELPHIMORPHIA	
Didelphidae	
Philander quica (Temminck, 1824)	(Rocha & Vrcibradic, 1998)