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SHORT NOTE

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Revisión de la dieta de *Cerdocyon thous* (Carnivora: Canidae), y el primer registro de *Bothrops moojeni* (Serpentes: Viperidae) como presa

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ABSTRACT

The crab-eating fox *Cerdocyon thous* has a diverse diet ranging from plants to vertebrates, but its diet has never been comprehensively reviewed. Here, we provide the first such review and report the first-ever record of *C. thous* feeding on the Brazilian lancehead *Bothrops moojeni*, although other *Bothrops* species have been documented in the diet of this fox species.

Keywords: Interspecific interactions, mammals, natural history, reptiles.

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RESUMEN

El zorro cangrejero *Cerdocyon thous* tiene una dieta diversa que va desde plantas hasta vertebrados, pero su dieta nunca ha sido revisada exhaustivamente. Aquí, brindamos la primera revisión de este tipo e informamos el primer registro de *C. thous* alimentándose de la serpiente punta de lanza brasileña *Bothrops moojeni*, aunque se han documentado otras especies de *Bothrops* en la dieta de esta especie de zorro.

Palabras clave: historia natural, interacciones interespecíficas, mamíferos, reptiles.

The crab-eating fox, *Cerdocyon thous* (Linnaeus, 1766), belongs (Carnivora: Canidae) is a generalist and opportunist (Faria-Corrêa *et al.* 2009) and is known to feed on a wide diversity of species including venomous snakes (de Cassia Bianchi *et al.* 2014). However, no recent scientific study has offered a comprehensive review of the dietary items recorded for *C. thous*. Herein we provide that dietary summary, motivated by our recent field observation of this species eating a Brazilian lancehead *Bothrops moojeni* (Hoge, 1966) for which we offer a detailed account.

To identify available literature on the diet of *C. thous*, we performed a search using the Google Scholar, Scopus, and Web of Science platforms with the keywords "*Cerdocyon thous, diet*." Our search considered all publications from the earliest found in the databases until March 2022, excluding unpublished dissertations and theses, and duplicate articles. Contributions that included data on the diet of *C. thous* were considered relevant, regardless of the written language and country of origin. From each relevant study, we harvested the following information: (1) dietary items reported, considering plants, invertebrates, and vertebrates; and (2) geographic location of the record.

We found 24 relevant studies during our literature review, which were published between 2002 and 2022. Cumulatively, these studies indicate that the diet of *C. thous* includes a wide range of plants, invertebrates, and vertebrates. The remarkably broad omnivorous dietary breadth of this animal suggests that knowledge of its dietary ecology at the level of individual prey species remains incompletely known. Previously identified dietary items for *C. thous* are enumerated in the supplementary material (1-4).

We add to this supplementary material by reporting the first case of *C. thous* consuming *Bothrops moojeni*. This venomous viper species is distributed throughout the Brazilian Cerrado where it inhabits mainly riverside areas (Nogueira *et al.* 2003). Reports of snakes of the genus *Bothrops* being preyed upon by other animals are particularly interesting because of the risk posed to predators by the potent venom of these snakes, which can cause serious physical damage (Nadur-Andrade *et al.* 2012). On 15 September 2016 at approximately 11:35 pm, while monitoring the herpetofauna of the "Nova Galia" sugar cane plantation in Paraúna, Goiás State, Brazil (17°18'46.33"S / 50°29'21.73"W, elev. 575 m), we observed a fox feeding on a still-living snake that it had immobilized on the ground with its front feet. The site was a recently-harvested sugar cane field with many stems scattered about and was approximately 90 m from a water body and 10 m from a dirt road. We identified the fox as *C. thous* based on its known distribution in the region and characteristics such as body size (about 6 kg), pointed face, short and narrow head, and grayish brown fur (Carlozzi 2011; Figs. 1a-b), plus the absence of a black spot at the base and tip of the tail which separates it from the similar co-occurring species *Lycalopex vetulus* (Lund, 1842) (Lemos *et al.* 2013). When the *C. thous* abandoned the remains of the snake, leaving about two-thirds of the body uneaten, we approached to examine it. We confirmed the identity of the snake as *B. moojeni* based on the known occurrence of the species in the region and the following physical features: an occipital stripe extending to the neck; a yellowish-brown to grayish-brown dorsum; dorsolateral triangle markings with an interrupted external line, center lighter than the edges, and light surrounding line; and a venter with almost no pigmentation (Campbell and Lamar 2004; Fig. 1c). The snake had a body length of approximately 50 cm, being an adult specimen. Soon after photography, we returned the snake carcass to the place of the predation event and

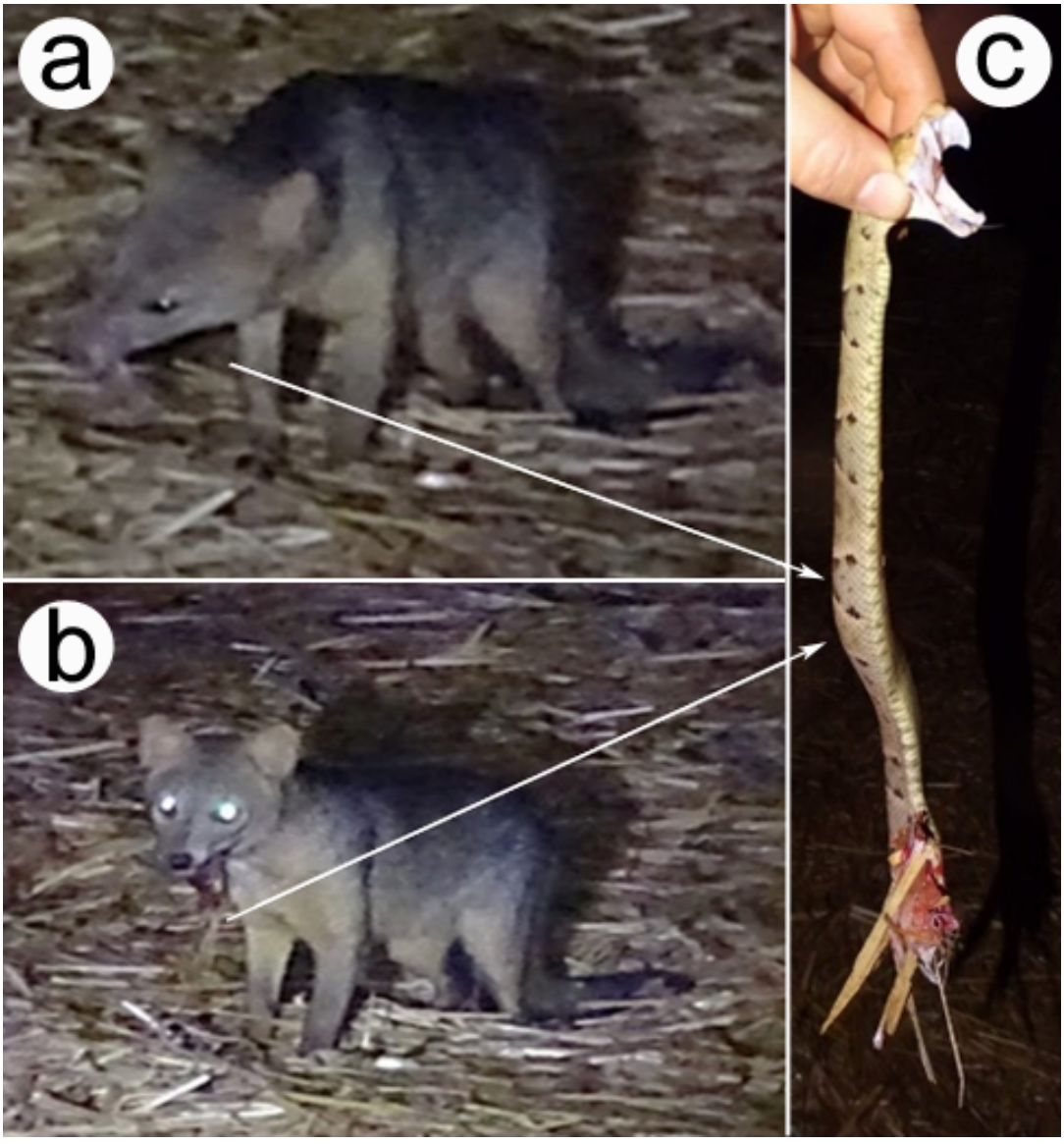

Figure 1. Views of a crab-eating fox consuming a Brazilian lancehead **a-b**. Views of the *Cerdocyon thous* actively consuming a Brazilian lancehead *Bothrops moojeni* in Paraúna, Goiás State, Brazil, **c**. the remains of the snake after the fox temporarily abandoned it.

observed the behavior of the *C. thous* from a distance. The fox, which had retreated some 30 m away, soon returned and resumed feeding on the snake.

Although we did not witness *C. thous* capturing the *B. moojeni* when first observed the snake was still moving slightly and thus clearly alive. Rocha *et al.* (2004) suggested that *C. thous* scavenges dead snakes, as reported elsewhere (Facure and Monteiro-F 1996), but Rocha *et al.* (2008) also highlight that venomous prey found in *C. thous* stomachs were well preserved which suggests that these animals were captured alive. Future studies can investigate the hypothesis that *C. thous* has hunting strategies for feeding on snakes, especially venomous ones. As shown by our literature review, many studies cannot or do not identify the dietary items of *C. thous* to the species level, and because few records exist at the moment of consumption, additional data are needed regarding this aspect of the behavior of *C. thous*, especially concerning venomous prey.

AUTHORS' PARTICIPATION

RAA led the writing with significant input from MBS and AMV. REB collected the data in the field. LRSS reviewed the manuscript.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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