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Field Report

Opportunistic predation of bats by crab-eating fox in Atlantic Forest, southeastern Brazil

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Abstract

The crab-eating fox *Cerdocyon thous* (Linnaeus 1766) has a varied diet, feeding on a wide variety of plant parts, small vertebrates, insects and even carrion. Here we report the opportunistic consumption of bats *Carollia perspicillata* and *Pygoderma bilabiatum*, which were captured in mist nets used during a bat survey in the Parque Natural Municipal de Nova Iguaçu, Rio de Janeiro State, Brazil. At least three bats of the two species were captured in the mist nets and predated by *C. thous*. The opportunistic diet is reported in the literature, however this is the first record of the consumption of bats by this species of canid.

Article

Known popularly as "graxaim", the crab-eating fox *Cerdocyon thous* has one of the largest distributions among canids, occurring in much of South America. In Brazil, it has already been registered in virtually all the biomes (Cheida et al. 2006). It is found in forested areas, the *cerrado,* open areas altered by human action, and agricultural regions (Berta 1982, Marinho-Filho 1992, Wozencraft 1993, Fonseca et al. 1996, Nowak 1999, Câmara and Murta 2003, Silva et al. 2004, Lim et al. 2006). Canids can be exclusively carnivorous predators or scavengers, but some species also feed on fruits and insects (Ewer 1973). The diet of these animals may vary depending on the type of habitat and climatic conditions (Redford and Eisenberg 1992). Reproductive patterns

may be affected in the same way (Bekkof et al. 1984). *C. thous* has an omnivorous generalist diet (Facure and Monteiro-Filho 1996). Depending on the habitat its diet may be predominantly carnivorous, consuming rodents and birds in high percentages (Pedó et al. 2006), or may be frugivorous (mainly *Syagrus romazofianum* (Rocha et al. 2004, 2008), or even omnivorous, depending on available resources (Facure and Monteiro-Filho 1996). This paper reports the opportunistic consumption of bats by *C. thous*.

The opportunistic observations of predation were made in an urban fragment of Atlantic forest in the Parque Natural Municipal (PNM) de Nova Iguaçu. The PNM de Nova Iguaçu is located in the Baixada Fluminense, in the Gericinó-Mendanha massif between the municipalities of Mesquita, Nova Iguaçu and Rio de Janeiro, Rio de Janeiro State, Brazil. It has an area of approximately 1,100ha of Atlantic Forest, characterized by a Dense Rainforest Montana and Lower Montana (Veloso et al. 1991); however, the park is bordered by other conservation units in the same massif, with a total area of almost 5,000ha of Atlantic Forest in excellent condition. The region has an altitude range of 150m at the entrance of the park to 965m at the highest point, the peak of Gericinó-Mendanha (SEMUAM 2001).

Since June 2008, research on the species diversity and feeding ecology of bats has been conducted in the PNM de Nova Iguaçu by the staff of Projeto Pró-Morcegos / UFRRJ. Bats are captured by placing eight to ten Zootech® mist nets (6-, 9- and 12 x 3m) in trails, forest edges, clearings and water courses. The mist nets are weighted between 18:00hrs to 06:00hrs the following day to ensure that the lower line remains at 0.5m above the ground and the upper line more than 3.5m above the ground. The nets are inspected approximately every 30 minutes.

Between 15-16 August 2009, at least three individuals of *C. thous* were sighted in the areas where the mist nets were weighted. On 15 August 2009 at 10:48hrs a male bat *Pygoderma bilabiatum* (Wagner 1843) (Family Phyllostomidae) was found dead in the mist net with signs of abrasion on his legs and a bleeding nose. The animal was trapped in the mist net about 1.2m above the ground. Two large holes were found in the same mist net. On the same day at 02:12hrs a male fox was observed removing a bat from the mist net with its mouth. The fox was balancing on its hind legs and biting the mist net, trying to remove the bat. On our approach the fox ran towards the forest edge, taking the bat that was trapped in the net. On 16 August 2009 at 16:08hrs, a pair of foxes was observed attacking a bat stuck in the mist net, approximately 0.7m above the ground. The pair remained at the mist net until the approaching researchers were less than two metres from them. At the mist net we found the wing (arm and forearm) of an individual bat *Carollia perspicillata* (Linnaeus 1758), and two large holes in the net where the bat had been.

Although *C. thous* has a generalist diet, energy gain is low (Facure 1996), and in some areas, this species has a predominantly carnivorous diet (Pedó et al. 2006). However, it is possible that bats are not common in their diet, as they would not normally encounter them. Most studies indicate that rodents represent the most commonly consumed vertebrates, and are most frequently encountered by *C. thous* (Facure and Monteiro-Filho 1996). However, carcasses are also a common resource (Bisbal and Ojasti 1980; Facure and Monteiro-Filho 1996). Therefore, under natural conditions the consumption of bats by foxes would only occur if the foxes encountered bat carcasses on the ground.

In general, canids are not considered as potential predators of bats, which are mainly consumed by birds of prey (Twente 1954, Vernier 1994) and snakes (Martins and Oliveira 1998, Esbérard and Vrcibradic 2007), although they may also be consumed by primates, felids, opossums, rodents and other bats (Wroe and Wroe 1982, Gardner et al. 1992, Fischer et al. 1997, Souza et al. 1997, Fellers 2000). Opportunistic predation of bats caught in mist nets has been recorded for other mammal species with generalist habits, such as the white-eared opossum *Didelphis albiventris* Lund, 1840 (Gazarini et al. 2008) and the omnivorous bat *Phyllostomus hastatus* (Pallas 1767) (Oprea et al. 2006).

Therefore, it is clear that *C. thous* has a generalist and opportunistic diet, which corroborates with the cited literature. Its diet may also include bats, although these are not live-caught.

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