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Field Report

Interference competition between the crab-eating fox and the hoary fox

Frederico G. Lemos^{1*}, Kátia G. Facure² and Alan N. da Costa³

¹ Pós-Graduação em Ecologia e Conservação de Recursos Naturais da Universidade Federal de Uberlândia, Instituto de Biologia, CEP:38400-902, Campus Umuarama, Uberlândia, Minas Gerais, Brazil.
E-mail: gemesio@uol.com.br

² Laboratório de Taxonomia, Ecologia Comportamental e Sistemática de Anuros Neotropicais, Instituto de Biologia, CEP:38400-902, Campus Umuarama, Uberlândia, Minas Gerais, Brazil. E-mail: katiafacure@netsite.com.br

³ Pós-Graduação em Ecologia e Conservação de Recursos Naturais da Universidade Federal de Uberlândia, Instituto de Biologia, CEP:38400-902, Campus Umuarama, Uberlândia, Minas Gerais, Brazil.
E-mail: alan_nilo@yahoo.com

* Correspondence author

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Abstract

This note describes an aggressive interaction between a crab-eating fox *Cerdocyon thous* and a hoary fox *Pseudalopex vetulus* observed on a cattle farm in the south of Goiás State, Central Brazil. The crab-eating fox chased and displaced the hoary fox, which was foraging at night in a pasture near a forest fragment. It is believed to be the first report of interference competition between these species.

Introduction

Interference competition occurs when individuals are directly antagonistic towards each other, generally involving behavioural, often aggressive interaction (Schoener 1983). Among carnivores, aggression between competing species may limit population distribution and abundance through spatial avoidance (Tannerfeldt et al. 2002; Kamler et al. 2003) and predation (Palomares and Caro 1999; Donadio and Buskirk 2006). Thus, interference competition has important implications

for carnivore conservation and management programmes (Linnell and Strand 2000; Glen and Dickman 2005).

The crab-eating fox has a wide distribution in South America, ranging from northern Colombia and Venezuela to Paraguay, Uruguay, northern Argentina and most of Brazil (Courtenay and Maffei 2004). The hoary fox is restricted to central Brazil (Dalponte and Courtenay 2004). Although previous studies have compared resource and habitat use of these species in sympatry (Juarez and Marinho-Filho 2002; Jácomo et al. 2004), there are no data on interference competition. The objective of this paper is to describe an aggressive interaction between a crab-eating fox and a hoary fox observed in the field.

Methods

Field work was conducted in September 2004 on a cattle farm in the Municipal of Cumari ($18^{\circ}22'S$, $48^{\circ}07'W$), south of Goiás State, central Brazil. The 494ha farm is located in the Cerrado biome; c. 90% is covered by cultivated pasture and the other 10% by gallery forest and cerrado sensu stricto. This region has two well-defined seasons, one wet and warm from September to March, and other dry and cold from April to August (Sano and Almeida 1998).

The interaction was observed during a study into hoary fox behaviour (Lemos et al. unpublished data). The dirt roads crossing the study area were driven in a pick-up truck from 18:00 to 24:00h, searching for foxes using the head lights and a portable 40-watt spotlight. When a fox was sighted, it was followed by the observer on foot and watched with binoculars at distance in order to minimize human interference. The interaction was filmed with a camcorder (Sony Handy Cam CCDTR517, lens 18x200mm) for subsequent description and quantification of behaviours.

Results

On 23 September at 23:20h, a hoary fox was found foraging in a pasture area near a forest fragment. After some minutes, two crab-

eating foxes arrived and one of them started to walk slowly towards the hoary fox, with its body lowered. On two occasions it stopped for a few seconds each time. When it was approximately 20m from the hoary fox, it suddenly advanced quickly towards it. The hoary fox ran away in the opposite direction. The crab-eating fox pursued the hoary fox for approximately 15m over six seconds, never getting closer than 10m from it. The crab-eating fox then returned and walked around the area where the hoary fox had been foraging, displaying piloerection of the back and tail fur. Then, it joined its co-specific and both individuals walked towards the forest fragment. The whole interaction lasted 160 seconds.

After the crab-eating foxes had moved off we searched for the hoary fox by vehicle, finding it at rest in a sitting position 300m from where the interaction had occurred. After few minutes it resumed foraging.

Discussion

Our observations indicate that through interference competition, crab-eating foxes can aggressively displace hoary foxes from their feeding areas. Such types of interaction may have implications for species ecology and conservation (Linnell and Strand 2000). As observed between Arctic foxes *Alopex lagopus* and red foxes *Vulpes vulpes* (Tannerfeldt et al. 2002), and between swift foxes *V. velox* and coyotes *Canis latrans* (Kamler et al. 2003), habitat utilization by hoary foxes in the study area may have been influenced by aggressive interactions with crab-eating foxes.

Interference competition is rarely reported among South American canids and available information consists only of indirect evidence of spatial displacement and inter-specific killing. In southern Chile, chilla or grey foxes *Pseudalopex griseus* are either excluded from or avoid areas occupied by culpeo foxes *P. culpaeus* (Johnson and Franklin 1994; Jimenez et al. 1996) and in central Brazil, both hoary and crab-eating foxes are reported as being prey items of maned wolves *Chrysocyon brachyurus* (Jácomo et al. 2004; Rodrigues et al. 2007). The present study is the first report of interference competition between the crab-eating fox and the hoary fox and it may represent the first

report of an observation of interspecific aggression among South American canids.

Relative body size influences the intensity and direction of interference interaction between mammalian carnivores (Palomares and Caro 1999; Donadio and Buskirk 2006). Crab-eating foxes are larger (adults averaging 5.7kg (Courtenay and Maffei 2004)) and more robust than hoary foxes (adults averaging 3.4kg (Dalmonte and Courtenay 2004)). The interaction described here is in agreement with the general trend observed in sympatric canids of larger species killing or displacing smaller ones. Future studies on the ecology and conservation of canids in the Cerrado biome should take into account interference competition between these species.

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References

- Courtenay, O. and Maffei, L. 2004. Crab-eating fox *Cerdocyon thous* (Linnaeus, 1776). Pp. 32-38 in C. Sillero-Zubiri, M. Hoffmann and D. W. Macdonald (eds.), *Canids: Foxes, Wolves, Jackals and Dogs*. IUCN/SSC Canid Specialist Group. Gland, Switzerland and Cambridge, UK.
- Dalmonte, J. C. and Courtenay, O. 2004. Hoary fox *Pseudalopex vetulus*. Pp. 72-76 in C. Sillero-Zubiri, M. Hoffmann and D. W. Macdonald (eds.), *Canids: Foxes, Wolves, Jackals and Dogs*. IUCN/SSC Canid Specialist Group. Gland, Switzerland and Cambridge, UK.
- Donadio, E. and Buskirk, S. W. 2006. Diet, morphology, and interspecific killing in Carnivora. *The American Naturalist* 167:524-536.
- Glen, A. S. and Dickman, C. R. 2005. Complex interactions among mammalian carnivores in Australia, and their implications for wildlife management. *Biological Reviews* 80:387-401.
- Jácomo, A. T. A., Silveira, L. and Diniz-Filho, J. A. F. 2004. Niche separation between the maned-wolf *Chrysocyon brachyurus*, crab-eating-fox *Cerdocyon thous* and the hoary-fox *Dusicyon vetulus* in the Cerrado of Central Brazil. *Journal of Zoology* 262:99-106.
- Jimenez, J. E., Yañez, J. L., Tabilo, E. L. and Jaksic, F. M. 1996. Niche-complementarity of South American foxes: reanalysis and test of hypothesis. *Revista Chilena de Historia Natural* 69:113-123.
- Johnson, W. E. and Franklin, W. L. 1994. Role of body size in diets of sympatric grey and culpeo foxes. *Journal of Mammalogy* 75:163-174.
- Juarez, K. M. and Marinho-Filho, J. 2002. Diet, habitat use, and home ranges of sympatric canids in central Brazil. *Journal of Mammalogy* 83:925-933.
- Kamler, J. F., Ballard, W. B., Gilliland, R. L. and Mote, K. 2003. Spatial relationships between swift foxes and coyotes in northwestern Texas. *Canadian Journal of Zoology* 81:168-172.
- Linnell, J. D. C. and Strand, O. 2000. Interference interactions, co-existence and conservation of mammalian carnivores. *Diversity and Distributions* 6:169-176.
- Palomares, F. and Caro, T. M. 1999. Interspecific killing among mammalian carnivores. *American Naturalist* 153:492-508.
- Rodrigues, F. H. G., Hass, A., Lacerda, A. C. R., Grando, R. L. S. C., Bagno, M. A., Bezerra, A. M. R. and Silva, W. R. 2007. Feeding habitats of the maned wolf *Chrysocyon brachyurus* in the Brazilian Cerrado. *Mastozoologia Neotropical* 14:37-51.
- Sano, S. N. and Almeida, S. P. 1998. *Cerrado: ambiente e flora*. Embrapa - CPAC, ppxii-56.

Schoener, T. W. 1983. Field experiments on interspecific competition. *The American Naturalist* 122:240-285.

Tannerfeldt, M., Elmhagen, B. and Angerbjörn, A. 2002. Exclusion by interference competition? The relationship between red and artic foxes. *Oecologia* 132:213-220

Frederico G. Lemos has a MSc in Ecology and Conservation of Natural Resources from the Federal University of Uberlândia. He has been working in the ecology, behaviour and conservation of wild canids in the Cerrado of Brazil since 2002.

Kátia G. Facure has a PhD in Ecology from the University of Campinas. She has been working in carnivore ecology, behaviour and conservation since 1990, with emphasis on diet and behaviour of wild canids and felids.

Alan N. da Costa has a MSc in Ecology and Conservation of Natural Resources from the Federal University of Uberlândia. He has been working in the fragmentation of ecosystems relating to the impact of leaf-cutting ants, *Atta laevigata* and *A. sexdens* with emphasis on the Cerrado biome.