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Perception and popular reports about giant anteaters (*Myrmecophaga tridactyla* Linnaeus, 1758) by two Brazilian traditional communities

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Abstract In Brazil, the giant anteater (*Myrmecophaga tridactyla* Linnaeus, 1758) is a mammal mentioned in some popular folklore stories, most often negatively. As a threatened mammal, listed in Brazil and world-wide as Vulnerable, such reports can negatively affect its conservation in some regions. The main purpose of this study is to describe perceptions about the physical and behavioral characteristics of giant anteaters and to verify the existence of popular reports involving these animals, in two Brazilian traditional communities where the species is relatively abundant in the wild. Through semi-direct interviews I registered 24 popular reports involving giant anteaters, three of which had been cited previously in the scientific literature.

Keywords: Conservation, giant anteater, *Myrmecophaga tridactyla*, semi-direct interviews, traditional communities, traditional ecological knowledge

Percepção e relatos populares sobre tamanduá-bandeira (*Myrmecophaga tridactyla* Linnaeus, 1758) por duas comunidades tradicionais brasileiras

Resumo No Brasil, o tamanduá-bandeira (*Myrmecophaga tridactyla* Linnaeus, 1758) é um mamífero alvo de histórias de cunho folclórico, sendo que em sua maioria o relacionam à aspectos negativos. Para um mamífero ameaçado de extinção, no status Vulnerável em nível nacional e internacional, a sua associação a relatos populares pode contribuir negativamente para a sua conservação em algumas áreas. Este estudo tem como finalidade reconhecer a percepção sobre características físicas e comportamentais dos tamanduás-bandeiras; e verificar a existência de relatos populares envolvendo o animal, já previamente citados ou não na literatura, em duas comunidades tradicionais onde a espécie ocorre relativamente em abundância na natureza. Através de entrevista semi-diretiva foram registrados 24 relatos diferentes em relação ao tamanduá-bandeira, apenas três deles relatados anteriormente pela literatura.

Palavras-chave: Conhecimento popular, conservação, entrevistas semi-diretivas, *Myrmecophaga tridactyla*, povos tradicionais, tamanduá-bandeira

INTRODUCTION

The giant anteater (*Myrmecophaga tridactyla* Linnaeus, 1758) is a mammal in the order Pilosa that specializes in feeding on ants and termites (Montgomery & Lubin, 1977; Redford, 1985). It occurs exclusively in South America, and in Brazil the original geographic range comprised all the country and biomes (Eisenberg & Redford, 1999; Medri *et al.*, 2006). Although considered a flagship species in South America, it is currently listed as Vulnerable by the IUCN Red List of Threatened Species (Superina *et al.*, 2010), as well as in Brazil (Medri & Mourão, 2008).

In Brazil, some popular folklore surrounds this animal, the majority of which describes giant anteaters negatively. Shaw & Carter (1980) listed three of these reports: (1) Giant anteaters can suffocate a person by placing the snout over the victim's mouth and nose; (2) According to some South American Indians and traditional community stories, giant anteaters are capable of killing jaguars (*Panthera onca*); (3) All giant anteaters are females and procreate by mating with lesser anteaters (*Tamandua tetradactyla*), which are all males. According to a fourth report, a giant anteater symbolizes bad luck, especially if it crosses someone's path. These reports can negatively impact

the conservation of giant anteaters in some localities where the animals are considered dangerous to humans (Shaw & Carter, 1980).

Understanding the connection between popular and scientific knowledge about an animal may enhance public awareness of it, as well as improve its conservation. In this study, popular knowledge about giant anteaters was gathered in two Brazilian traditional communities where the species is relatively abundant in the wild. Traditional people were defined, following Wavey (1993) and Diegues & Arruda (2001), as human groups that are culturally different, somewhat isolated, adapted to specific ecological niches, and maintain their way of life over generations. Using semi-direct interviews, I hoped to identify perceptions about the physical and behavioral characteristics of giant anteaters and to verify the existence of popular reports involving this species.

MATERIALS AND METHODS

Brazilian traditional communities

The first community is located at a rural zone of São Roque de Minas (20°13'57"S, 46°22'10"W), Minas Gerais State, and is mainly comprised of small land owners in the area surrounding Serra da Canastra National Park. This community is known as land workers. Interviews were conducted there in September 2009. The second community is located at Fazenda Nhumirim (18°59'16"S, 56°36'52"W), in the Pantanal wetland of Mato Grosso do Sul State. The people there are cattle ranchers and their workers. These people are known as *pantaneiros*. For this community, interviews were conducted in June 2009 and February 2010.

Both traditional communities are situated in geographic regions where giant anteaters are relatively abundant in the wild, so it was expected that the respondents knew the animal.

Interviews

Popular folklore and stories about giant anteaters were gathered using semi-direct interviews (10 people in each community), through oral and writing communication. Semi-direct interviews involve a series of guideline questions, exposed to the respondents (Huntington, 1998; Kapila & Lyon, 2006).

Respondents were officially informed about the purpose of the study with a Statement of Consent form that was evaluated and approved by the Ethics Committee of Universidade Federal de Mato Grosso do Sul.

The first step was talking to each respondent briefly to describe the purpose of the study and its aims and to provide a succinct description of a giant

anteater. Because both the giant anteater and the lesser anteater (*Tamandua tetradactyla*) were present in each community, it was made clear that the focus of the study was the giant anteater. The questions contained in the interview were clear and easy to comprehend in terms of vocabulary (Appendix 1).

When an answer invoked information from other people, the information was classified as coming either: (1) from a relative, or (2) popular imagination. I defined as popular imagination reports that used phrases such as "is told by people", "everyone here knows that" and "this is what people say".

Data were analyzed quantitatively and qualitatively, and the answers of each respondent were compared with those of the others. First, an analysis of objectivity was performed to eliminate information not consistent with the study goals. The same answer from the same respondent to two different questions was considered as one. Open answers were categorized according to the origin: morphologic, behavioral, or subjective.

RESULTS

I interviewed 20 people. The average age of the respondents was 50.79±11.10 years (range 33–66 years). All the respondents knew the giant anteater and had seen at least one animal in its natural habitat. Only two people from the *pantaneiros* group knew other names for the animal, such as *Jurumi*, *Bandeira*, and *Bandurra*.

Perceptions about physical and behavioral characteristics of giant anteaters

Characteristics of giant anteaters cited by respondents were: hairy and long tailed (24.6%), long snout (24.6%), slow gait (8.2%), good looking (8.2%), strong claws (6.56%), stripes on the body (6.56%), long tongue (6.56%), carries the offspring on the back (4.9%), sleeps with the tail folded over the body (3.3%), big animal (3.3%), footprint is similar to a child's footprint (1.64%), and good sniffer (1.64%). The answers were divided into Morphologic, Behavioral, and Subjective categories (TABLE 1).

Only one respondent did not know what giant anteaters eat. For the remainder "ants" was the most cited (37.3%), followed by "termites" (35.3%). Other answers showed low percentage and were complementary to these two (TABLE 2).

Popular reports involving giant anteaters

I registered 24 types of popular reports involving giant anteaters. The most cited by respondents were: giant anteaters attack humans (18.8%), attack dogs (15.9%), symbolize bad luck, especially if one crosses a person's path (5.8%), are good swimmers (4.3%), have a fast gait in woody environments (4.3%), their meat is consumed by humans (4.3%),

TABLE 1. Characteristics of giant anteaters (*Myrmecophaga tridactyla*) cited by respondents from two Brazilian traditional communities, by category and number of answers.

Characteristics	Category	Number of answers	%
Hairy and long tailed	Morphologic	15	24.60
Long snout	Morphologic	15	24.60
Slow gait	Behavioral	5	8.20
Good looking	Subjective	5	8.20
Strong claws	Morphologic	4	6.56
Stripes on the body	Morphologic	4	6.56
Long tongue	Morphologic	4	6.56
Carries the offspring on the back	Behavioral	3	4.90
Sleeps with the tail folded over the body	Behavioral	2	3.30
Big animal	Subjective	2	3.30
Footprint is similar to a child's footprint	Morphologic	1	1.64
Good sniffer	Behavioral	1	1.64

found the dead bodies of giant anteaters and jaguars clinging to each other (4.3%), their claw marks can be seen on trees and termite mounds (4.3%), remains of burned animals have been found (4.3%), and they sleep with the tail folded over the body (4.3%). Other information was mentioned only once or twice. Sixteen of these 24 reports were witnessed by respondents (TABLE 3).

When the respondents were questioned about how dangerous giant anteaters are, all of them answered that the animal is not dangerous at all. However, 17 respondents had reservations: "if it is touched" (35%), "if it is threatened (persecuted or cornered)" (19.3%), "if it is in a woody patch" (19.3%), "if needed, it knows how to defend itself" (11%), "only if molested" (7.7%) and "if the mother carries her pup" (7.7%).

When asked about gender, 17 respondents said that there are male and female giant anteaters, two respondents said that there are only females, and one respondent answered that giant anteaters are hermaphrodites.

Regarding the giant anteater's predators there were four answers: jaguars and pumas, snakes, humans, and it has no predators. When questioned about the giant anteater's ability to kill, and if it uses its claws to do so, all respondents answered yes. Finally, when questioned about which animals the giant anteater is able to kill, there were different answers such as: dogs, crab eating foxes (*Cerdocyon thous*), anything except jaguars and pumas, deer, hares, jaguars, humans, and any small animal.

DISCUSSION

Traditional and local ecological knowledge helps to guide a community in such a way that people feel connected to the environment around

TABLE 2. Food items in the diet of giant anteaters (*Myrmecophaga tridactyla*), as cited by respondents from two Brazilian traditional communities, and number of answers.

Food items	Number of answers	%
Ants	19	37.25
Termites	18	35.3
Bugs	4	7.84
Baby birds	1	1.96
Eggs	1	1.96
Human food	1	1.96
Honey	1	1.96
Spiders	1	1.96
Larvae	1	1.96
Wood	1	1.96
Fruits	1	1.96
Leaves	1	1.96
Do not know	1	1.96

them, including the local fauna. This study shows that people in two Brazilian traditional communities knew many morphological and behavioral details about giant anteaters, and had many subjective impressions of the animals.

The giant anteater is highly specialized for feeding on ants and termites, although honey cannot be ignored as a rare and uncommon feeding resource, as its ingestion was evidenced once at Emas National Park (Miranda *et al.*, 2003). Consistent with the scientific view that giant anteaters are obligately myrmecophagous (Redford, 1985), 80.39% of the respondents in this study stated that anteaters consume "ants", "termites", and "bugs" (excluding the one respondent who did not know what giant anteaters eat). This demonstrates that the respondents had good knowledge about the diet of giant anteaters.

TABLE 3. Popular reports involving the giant anteater (*Myrmecophaga tridactyla*), as cited by respondents from two Brazilian traditional communities, by origin and observations.

	Popular report	Number of reports	Origin of report			Observations
			Observed by respondent	Told by relative	Popular imagination	
1	Attacks dogs	11	6	1	4	
2	Attacks humans	13	4	1	8	
3	Enters a market	2	2	0	0	In Campo Grande city, Mato Grosso do Sul State
4	Symbolizes bad luck, especially if it crosses a person's path	4	0	0	4	
5	Good swimmer	3	2	0	1	
6	Fast gait in woody environments	3	1	0	2	
7	Meat is consumed by humans	3	2	0	1	One respondent said that it tastes bad
8	Anteaters may emit roars	2	1	0	1	One respondent said that only the males roar
9	Found dead giant anteaters clinging to dead jaguars	3	0	1	2	
10	Agonistic encounter between a maned wolf (<i>Chrysocyon brachyurus</i>) and an anteater	2	1	1	0	
11	Claw marks on trees and termite mounds	3	3	0	0	
12	Found burned giant anteater	3	2	1	0	All reports were associated with wildfires
13	Sleeps with the tail folded over the body	3	3	0	0	
14	Tame giant anteater	2	2	0	0	When grown up around humans
15	Can suffocate a dog by placing its snout over the dog's mouth and nose	1	0	0	1	
16	To save a person that is being attacked by an anteater, one has to bite the animal's snout	2	0	0	2	
17	A snake bite can be deadly for the giant anteater	1	1	0	0	
18	Defecates in the water	1	1	0	0	
19	In order to approach a giant anteater the wind must be in your favor	2	2	0	0	
20	Displays of docile behaviors depending on lunar phases	1	0	0	1	
21	It eats more termites depending on lunar phases	1	0	0	1	
22	Dogs fear giant anteaters	1	0	0	1	
23	It protects itself from fire hiding in water	1	0	0	1	
24	Offspring sleeps on the mother's back	1	1	0	0	

The three types of folklore reported previously by Shaw & Carter (1980) were found during this study. One respondent said that a giant anteater caused asphyxia with its snout/tongue; however, the attack was on dogs. Three respondents stated that the giant anteater is capable of killing jaguars, and that dead bodies of giant anteaters and jaguars clinging to each other were also found. Details

provided by the respondents attempted to show how this could be possible. For example, it was claimed that the giant anteater kills a jaguar by perforating the skin with its claws, and the jaguar kills an anteater by biting on the neck. This information seems to come from an indigenous Brazilian source (Shaw & Carter, 1980), and probably is a fable relating to the balance of forces in nature. Even so, giant

anteaters do occur in the diet of jaguars (Cavalcanti & Gese, 2010). However, there are no data suggesting that giant anteaters kill jaguars.

Folklore that there are no male giant anteaters appeared on three answers, two of which affirmed that the species is composed only of females, and one that stated giant anteaters are hermaphrodites. When questioned why they believed such a theory, the answer was that it was impossible to see any genitalia, so anteaters must not have testicles. The lack of sexual dimorphism and the fact that males have internal testicles no doubt helped to foster this interpretation.

The idea that the giant anteater symbolizes bad luck was mentioned in four answers. Specific maladies included: "if an animal crosses someone's path, while going fishing, that person will not catch any fish" and "if you are going somewhere and a giant anteater crosses your path, it's better to go back or something bad will happen". One respondent said that when a giant anteater crosses in front of a truck it brings bad luck to the truck driver, and the only way to break this curse is to kill the anteater and remove the claws as an amulet. The respondent also said that this could be the cause of many accidents on the roads that provide access to the Pantanal. Another xenarthran, the fairy armadillo *Calyptophractus retusus*, also symbolizes bad luck among the Izoceño people of the Bolivian Gran Chaco. *Calyptophractus retusus* is not required for food but is killed whenever found; this hunting comes from a belief that the animal is a bad luck omen, foretelling an impending death in the family (Cuéllar, 2001).

Many of the reports in this study indicated knowledge of the giant anteater's behavior, and are consistent with scientific findings. For instance, some giant anteaters are injured or even killed during forest fires (Silveira *et al.*, 1999) which would lead to the discovery of burned remains. Scientific literature that confirms other reports shows that giant anteaters: leave claw marks in natural structures such as trees and termite mounds (Braga *et al.*, 2010); take baths and defecate in various bodies of water (Emmons *et al.*, 2004); are eaten by humans (Lizot & Ross, 1979; Leeuwenberg, 1997); and fold the tail over the body to conserve body heat while sleeping (Shaw & Carter, 1980; Wetzel, 1985; Medri & Mourão, 2005). Likewise, in semi-captive conditions it has been shown that the mother carries the offspring for about three months, until they are self-sufficient, and as time goes by the pups spend less time on the mother's back (Jerez & Halloy, 2003). Evidence regarding sensory abilities includes that, when the wind is in the observer's favor, it is easier to approach a giant anteater without being detected (Shaw & Carter, 1980). Other studies further indicate the olfactory sense is very acute (McAdam & Way, 1967), but vision is poor (Redford, 1994). In

Nicaragua, dogs often accompany hunters in order to hound giant anteaters and force the animal into a defensive posture (Koster, 2008). In such a situation giant anteaters might attack dogs or even humans (Shaw & Carter, 1980). It is also possible that dogs with a negative previous experience with anteaters might develop fear of the animal.

Despite the assertion of Shaw & Carter (1980) that in South America giant anteaters are considered dangerous to humans, all respondents in this study did not view the animals as a hazard, stating they pose no real danger if unmolested or not threatened. Of course, the same could be said for almost all mammalian species.

Popular imagination, or folklore, brings the benefit of people recognizing an animal, but whether the animal is viewed negatively or positively depends on the nature of the myth. For example, in some Chinese communities, animals are associated with a spiritual realm and are worshiped and respected (Xu *et al.*, 2005). For any species, it is essential to know what an animal actually represents and what it symbolizes. Conservation programs must incorporate ethnobiological studies in order to understand the social and cultural attributes that communities give to species. Positive attributes can be used to facilitate conservation goals, while negative views may require a program of demystification.

There is a wide variety of studies in the scientific literature about local and traditional ecological knowledge (*e.g.*, De Bôer & Baquete, 1998; Gilchrist *et al.*, 2005; Cocks & Dold, 2006; Forth, 2007; Daw *et al.*, 2011). These often have implications for conservation plans. For example, a study using a semi-direct questionnaire about belugas (*Delphinapterus leucas*) found that people from traditional communities described in details aspects of interactions with humans and anthropogenic influences (Huntington, 1998). Such information was rare in the published literature on belugas. Research on the crab *Ucides cordatus* demonstrated that knowledge from people that gathered the crabs provided a useful basis for understanding local crab stocks and their population dynamics (Alves *et al.*, 2005). A study aiming at perceptions of human-carnivore conflicts found that hunting is probably a conservation problem for the Andean cat (*Leopardus jacobitus*), a little known carnivore and one of the world's most threatened felids (Lucherini & Merino, 2008). Another study with *Aquilaria*, an Asian resin producer plant, showed that traditional knowledge can assist in identifying areas of research for vegetal domestication (Donovan & Puri, 2004).

Most of the popular reports told by these two Brazilian traditional communities seemed to have an origin in morphologic and behavioral aspects of giant anteaters. For most of the respondents, there

was not much concern with the human-animal relationship. However, more studies with an ethnobiology focus need to be done in both localities, as well as elsewhere. Specifically, it would be useful to increase the number of interviewers, to interview in other places, and with other traditional people, such as some native indigenous tribes. The reports about anteaters killed on the road having their claws removed for an amulet need to be investigated. Is this a common practice? Does it really happen? Another important question concerns what happens to folklore in regions where giant anteaters are critically threatened. Do traditional reports disappear, or do they go on, even after local extinction?

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APPENDIX

Personal Identification

Name / Birth date / Place of birth / Phone number / Religion / Scholary level

Questions

1. Do you know the animal called giant anteater?
2. Do you know it by any other names? If so, which ones?
3. Could you point out some of the giant anteater's characteristics?
4. What does this animal feed on?
5. Do you know any myth, story or report that involves this animal? If yes, which ones?
6. Did you witness any myth, story or event? If not, who told you about it?
7. Do you think the giant anteater is a dangerous animal? Why?
8. Did you see any attack from this animal to a human being or another animal? If so, are you able to describe what you saw?
9. Have you ever seen a giant anteater hit by a car? If so, on which road?
10. Do you believe that giant anteaters have only one gender (for example, only males)? If so, do you have an explanation for it?
11. Do you know any giant anteater predator? Which one?
12. Do you think that a giant anteater is capable of killing another animal using only the claws? If yes, which animal?