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The Use of Wild Birds by Rural Communities in the Semi-arid Region of Rio Grande do Norte State, Brazil

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ABSTRACT

Wild animals, especially birds, are widely used by local populations for many different purposes in the semi-arid region in Northeastern Brazil. The present work was undertaken with the help of rural inhabitants in the municipality of Serra Negra do Norte in the semi-arid region of Rio Grande do Norte State, Northeastern Brazil, with the purpose of identifying the bird species used as well as their utility. A use-value (UV) was calculated for each bird species to indicate its relative importance. The rural inhabitants customarily used 30 bird species distributed among 14 families and seven orders, with a predominance of species of the families Columbidae (23.33%), Emberizidae (16.67%), and Icteridae (16.67%). These birds were used for different purposes in the study area, with 70.00% being kept as pets, 43.33% eaten as food, 20.00% negotiated commercially, 10.00% were used in association with local mystical beliefs, and 3.33% used in preparing folk medicines; the same species could be included in more than one category. The use-values of the species cited varied from 0.032 to 0.548, with special emphasis on: *Zenaida auriculata* 'Ribaçã' (UV=0.548); *Sporophila albogularis* 'Golinha'; *Leptoptila verreauxi* 'Juriti' (UV=0.452); *Nothura boraquira* 'Codorniz' (UV=0.419); *Icterus jamacaii* 'Concriz'; and *Patagioemas picazuro* 'Asa-branca' (UV=0.387). These results indicated the cultural importance of wild birds to these rural inhabitants as well as their preferences for certain species, especially as pets and as food. It is hoped that the information presented here will contribute to conservation planning for the avifauna of this region.

Keywords: avifauna, cynegetic activities, conservation, ethnoornithology, ornitofauna

INTRODUCTION

Humans have been interacting with an extremely wide variety of animals since prehistoric times (Alves *et al.* 2007, 2010). This variety of interactions between humans and animals is the subject matter of ethnozoology - the branch of ethnobiology that investigates the knowledge human societies have accumulated concerning animals, as well as their significance to those people and their uses (Overal 1990). Although animals have played important roles in human cultures from remote times, these themes have been only poorly studied – especially in comparison with the accumulation of works involving plants. But due to the importance of human-animal relationships, especially in economic and environmental terms, ethnozoological studies have been generating increasing interest in recent years (Balderas *et al.* 2001; Naranjo *et al.* 2004; Alves and Pereira-Filho 2007; Alves *et al.* 2009b, 2010; Fernandes-Ferreira *et al.* 2010).

Birds are perhaps the most easily seen vertebrates under natural conditions, due to their (often) bright plumage and wide variety of calls (Farias *et al.* 2005). According to Navarijo (1999), birds are associated with a large number of economic activities such as agriculture, hunting and fishing, foods and medicines, and have decorative and symbolic functions (among many other uses). A total of 510 bird species have been identified in the "Caatinga" (dryland) region of Brazil (Silva *et al.* 2003), and many of them are used by the local populations – although studies examining the distribution, ecology and ethnoecology of this avifauna are still rare. Approximately 15% of the Brazilian population (more than 25 million people) live in the "Caatinga" biome (Mittermeier *et al.* 2002), and the adverse climatic conditions of this environment has obliged a large part of this population to adopt unique socio-cultural structures and a strong dependence on the direct use of the available natural resources and close relationships with the local faunal and floristic resources (Alves *et al*. 2009a).

Among the diverse sub-areas of Ethnozoology, Ethnoornithology focuses on studying and understanding the cognitive, behavioral, and symbolic relationships between humans and birds (Farias and Alves 2007; Tidemann and Gosler 2010). Various ethno-ornithological studies have been undertaken in different parts of the world, with a notable growth of works examining the ways in which wild birds are used by populations of Amerindians, fishermen, rural inhabitants, and bird breeders, among others. Some examples of these studies include: Balderas *et al.* (2001), who studied the use of cynegetic, ornamental and song birds in Nuevo León State in Mexico; Jepson and Ladle (2009) who studied the ways in which birds are kept as pets in Java and Bali, and Alves *et al.* (2010) who studied the birds kept as pets in the town of Catolé da Rocha, in Paraíba State, Brazil.

It is important to understand the relationships that exist between the local habitants and the animals they come into contact with, the manners in which these animals are used and the species most frequently used in order to assure the sustainable availability of these living resources. In light of the fact that birds are of great local economic and cultural importance, ethnoornithological studies will be fundamental to elaborating conservation and management strategies.

The present work was undertaken in the municipality of Serra Negra do Norte in northeastern Brazil and identified the wild birds used by the local rural inhabitants and characterized the different manners in which they were utilized.

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Research Note

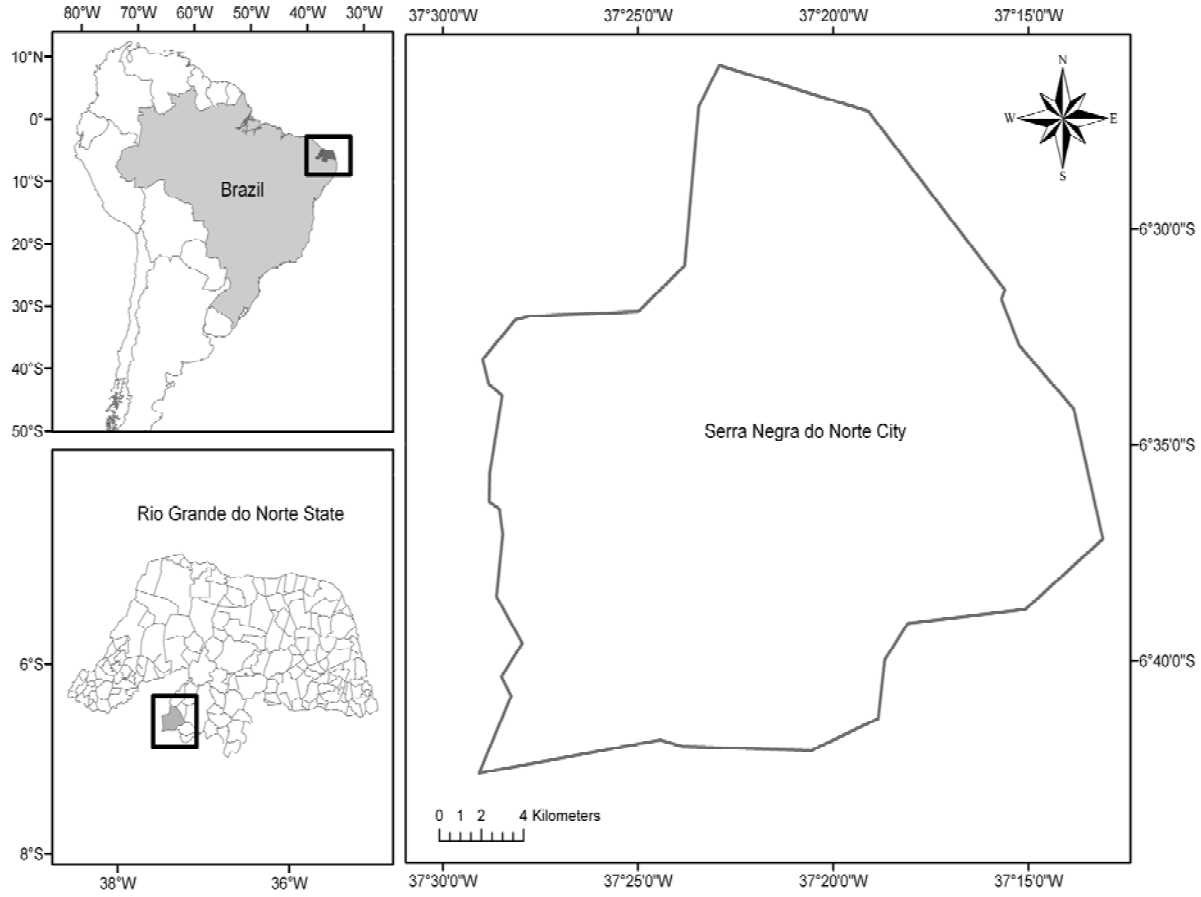

Fig. 1 Map of study area, of Serra Negra do Norte, Rio Grande do Norte State, Brazil.

MATERIALS AND METHODS

Study area

The present study was carried out in the municipality of Serra Negra do Norte (**Fig. 1**) in Rio Grande do Norte State, Brazil (06° 39' 57" S x 37° 23' 49" W). The regional climate is dry and hot, with the rainy season during the austral summer/fall (generally between January and April) (Amorim *et al.* 2005). The regional vegetation is hyperxerophytic open shrubby "caatinga" (deciduous dryland vegetation).

Population

The total resident population in the municipality was 7,770 inhabitants, with 4,997 living in urban areas and 2,773 in the rural zone (IBGE 2010). The rural inhabitants who own relatively small plots of land where they practice subsistence agriculture and raise cattle and goats; they also hunt and capture wild animals for consumption, to keep as pets, or for commercial ends.

Sampling procedures

Investigations of the repertoires of symbols, concepts, and perceptions related to the regional avifauna, as well as the traditional knowledge acquired by the local rural inhabitants in relation to these animals was undertaken using free and semi-structured interviews. The interviews were recording on a MP3 device and subsequently transcribed (with the greatest fidelity possible). The interviews included questions about the types of birds used and the manners in which they were utilized. The interviews were conducted between September and December, 2009 and from January to March, 2010.

The consistency and validity of the responses were verified through the use of sequential interviews in synchronic and diachronic situations. Synchronic interviews consist of presenting the same question to different a number of individuals in close time intervals, while in diachronic interviews the same question is repeated to the same individual at very distinct moments in time.

Thirty-one people were interviewed (2 women and 29 men) with ages varying from 14 to 71 years. The choice of informants was initially random, but as more knowledgeable informants were encountered we were able to employ the "snowball" technique (Bailey 1982), whereby subsequent interviewees were indicated as knowledgeable specialists by earlier interviewees. This series of sequential indications allowed us to identify key-informants – people who had the most experience or retained the most specialized knowledge about the subjects under investigation.

We identified the birds cited by the interviewees to the species level (with the aid of manuals and specific literature) by showing the informants pictures of the birds, through direct observations of the animals cited and by identifying photographs taken of the specimens (Perlo 2009). The scientific nomenclature utilized in the present study follows the recommendations of the Comitê Brasileiro de Registros Ornitológicos (CBRO 2010).

The project was approved by the Research Ethics Committee of the Hospital Universitário Lauro Wanderley. The purpose and general objectives of the study were always explained to the potential interviewees (in an accessible manner) before initiating the interviews. When asking the permission of these people to undertake the interviews and record their responses we always respected the right of a person to refuse to participate, and likewise guaranteed their anonymity.

Data analysis

The use-value (UV) of a species is a quantitative measure designed to demonstrate its relative importance to a community, independent of the opinion of the researcher (Phillips *et al.* 1994). The UV of the species were calculated using the following formula, based on a single interview with each informant:

$$UV = \Sigma U / n$$

where: UV = use-value of the species; U = number of citations per species; n = number of informants.

RESULTS AND DISCUSSION

A total of 30 species of wild birds were cited, distributed among 14 families and 7 orders. Of the 14 families recorded, Columbidae (23.33%) was the most well represented, with seven species; followed by Emberizidae (16.67%) and Icteridae (16.67%) with five species each.

Birds were used in various different manners by the local inhabitants: 70.00% were kept as pets, 43.33% were eaten, 20.00% were commercialized, 10.00% were associated with religious beliefs, and 3.33% were used as zootherapeutics; the same species was often included in more than one category. Balderas *et al.* (2001) likewise reported that the avifauna in Mexico was hunted for many different purposes, including subsistence (food), sport, commercial reasons, to control predators, and to capture specimens associated with folk religious beliefs.

In the present study, commercial transactions with birds were restricted to species raised as pets and were undertaken discreetly among the breeders themselves. Birds taken for food were not sold, but were consumed as subsistence items by the hunter and his family.

The UV of the species cited by the interviewees varied from 0.032 to 0.548, with the following wild birds showing the highest values: *Zenaida auriculata* – "Ribaçã" (UV = 0.548); *Sporophila albogularis* – "Golinha" and *Leptoptila verreauxi* – "Juriti" (UV = 0.452); *Nothura boraquira* – "Codorniz" (UV = 0.419); *Icterus jamacaii* – "Concriz" and *Patagioemas picazuro* – "Asa-branca" (UV = 0.387); *Paroaria dominicana* – "Galo-de-campina" (UV = 0.290) (**Table 1**). Representatives of the family Columbidae were the most important sources of protein, which corroborates the findings of Alves *et al.* (2009a) and Alves *et al.* (2010) who studied cynegetic activities and the use of wild birds in a number of municipalities in the semi-arid region of Paraíba State, Brazil.

In terms of the birds kept as pets, the rural inhabitants surveyed in the present study favored keeping species of the order Passeriformes – a taxon with a large number of songbirds greatly sought after by private owners as well as commercial agents (Pagano *et al.* 2009; Alves *et al.* 2010). Gama and Sassi (2008) noted that raising wild animals in captivity is a very old and well-established custom that makes up part of the every-day lives of many people; it represents a habit that originated in rural areas and was later transplanted to urban situations.

Among the Passeriformes, species of the families Emberizidae and Icteridae were the most sought-after by rural inhabitants in the study area, and Emberizidae was the principal taxon associated with the illegal commerce in wild

Table 1 Species list of the wild birds used by the rural inhabitants ("sertanejos") living in the municipality of Serra Negra do Norte, Rio Grande do Norte State, Brazil.

Taxa	Local name	Use-Value	Types of uses*
Tinamidae Gray, 1840			
Nothura boraquira (Spix, 1825)	Codorniz	0.419	F
Anatidae Leach, 1820			
Dendrocygna viduata (Linnaeus, 1766)	Marreca	0.097	F
Ralidae Rafinesque, 1815			
Gallinula galeata (Lichtenstein, 1818)	Galinha-da-água	0.129	F
Cariamidae Bonaparte, 1850			
Cariama cristata (Linnaeus, 1766)	Seriema	0.161	F
Columbidae Leach, 1820			
Columbina minuta (Linnaeus, 1766)	Rolinha-cabloca	0.129	F/P
Columbina talpacoti (Temminck, 1811)	Rolinha caldo-de-feijão	0.161	F/P
Columbina squamata (Lesson, 1831)	Rolinha-cascavelim	0.290	F/P
Columbina picui (Temminck, 1813)	Rolinha-branca	0.258	F/P
Patagioemas picazuro (Temminck 1813)	Asa-branca	0.387	F
Leptotila verreauxi (Bonaparte, 1855)	Juriti	0.452	F
Zenaida auriculata (Des Murs (1847)	Arribaçã	0.548	F
Psittacidae Rafinesque, 1815			
Aratinga cactorum (Kuhl, 1820)	Periquito	0.226	P
Forpus xanthopterygius (Spix, 1824)	Papacu	0.065	P
Turdidae Rafinesque, 1815			
Turdus rufiventris (Vieillot, 1818)	Sabiá-laranjeira	0.097	P
Mimidae Bonaparte, 1853			
Mimus satuminus (Lichtenstein, 1823)	Papa-sebo	0.032	P
Emberizidae Vigors, 1825			
Sicalis flaveola (Linnaeus, 1766)	Canário-da-terra	0.258	P/C
Sporophila nigricolis (Vieillot, 1823)	Papa-capim	0.194	P/C
Sporophila lineola (Linnaeus,1758)	Bigode	0.129	P
Sporophila albogularis (Spix, 1825)	Golinha	0.452	P
Sporophila bouvreuil (Statius Muller, 1776)	Cablocolindo	0.129	P/C
Icteridae Vigors, 1825			
Icterus cayanensis (Linnaeus, 1766)	Xexéu-de-bananeira	0.129	P/C
Icterus jamacaii (Gmelin, 1788)	Concriz	0.387	P/C/M
Gnorimopsor chopi (Vieillot, 1819)	Craúna	0.161	P
Molothrus bonariensis (Gmelin, 1789)	Azulão	0.032	P
Procacicus solitarius (Vieillot, 1816)	Bico-de-osso	0.032	P
Fringillidae Leach, 1820			
Euphonia chlorotica (Linnaeus, 1766)	Vem-vem	0.032	M
Corvidae Leach, 1820			
Cyanocorox cyanopogon (Wied, 1821)	Can-cão	0.129	Z//M
Traupidae Cabanis, 1847			
Lanio pileatus (Wied, 1821)	Soldadinho	0.032	P
Paroaria dominicana (Linnaeus, 1758)	Galo-de-campina	0.290	P/C
Phalacrocoracidae Reichenbach, 1849			
Phalacrocorax brasilianus (Gmelin, 1789)	Pato-porco	0.032	F

*C- commerce; F- food; M- mystical beliefs; P- pet; Z- zootherapeutics.

birds; similar results were reported by Ferreira and Glock (2004) and Gama and Sassi (2008). This observed preference for the Passeriformes is related to the melodious songs of these birds and the fact that they are relatively easy to maintain in captivity. These birds eat seeds almost exclusively, which translates into lower feeding costs and greater ease in maintaining their cages clean and sanitary (Pagano *et al.* 2009).

The interviewees noted that the species *Euphonia chlorotica* and *I. jamacaii* can bring bad luck to their owners; *Cyanocorox cyanapogon*, on the other hand, can help avoid misfortune.

The species *C. cyanapogon* is also believed to help prevent/cure respiratory diseases. According to the interviewees, if this bird is kept as a pet and fed with left-over food from someone with a respiratory disease that person will be cured after a certain time. Almeida (2005) reported that these birds have been continually used in traditional medical practices in Brazil since colonial times; Alves *et al.* (2007) noted that birds of this group are frequently used in popular medicinal practices in many regions of Brazil. Other examples of birds cited as being zootherapeutical resources are: *Coragyps atratus* and *N. boraquira* (Vargas-Clavijo and Costa-Neto 2008, Alves *et al.* 2009b; Confessor *et al.* 2009; Ferreira *et al.* 2009).

CONCLUSION

The rural communities in Serra Negra do Norte utilize a wide variety of bird species, principally as pets or as protein sources in their diets. The Columbidae stood out as the most well represented family as well as the taxa with the highest use-values; the Passeriformes were the group most frequently kept as pets. The widespread use of wild birds shown in this and other studies indicates a maintained interest in these practices and evidences the need for measures aimed at the sustainability of wild avifauna use in the semi-arid region of northeastern Brazil.

Hunting (and capturing) wild birds in the dry "Caatinga" region of northeastern Brazil has greatly contributed to the population declines noted in many species. Our results demonstrated the local avifauna is widely used for different ends in the region – in spite of the fact that all of these species are protected by federal statues forbidding hunting/capturing wild animals in any part of the country. Strong cultural traditions help perpetuate these predatory habits as hunting, keeping wild animals as pets, and the use and commerce of wild birds are all customs passed down through many generations. Any steps that might be taken to help guarantee the sustainability of wildlife populations must therefore incorporate considerations of the cultural habits of the neighboring human inhabitants.

As such, additional investigations will be needed not only of the bio-ecological aspects of the avifauna, but also of their interactions with human populations – as any analysis of the true situation of the wild bird species of the Caatinga region, or the elaboration of conservation and sustainable use programs, must take into account anthropogenic modifications of the regional and local environments and the interactions of these animals with human populations.

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