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Traditional knowledge of the wild mammals and their ecological interactions by community indigenous Apiaká, Southern Brazilian Amazon Rainforest

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ABSTRACT

The objective of this study, undertaken in the Mato Grosso State, Southern Brazilian Amazon Rainforest, was to gain an understanding of what the Apiaká indigenous know of the mammals of natural occurrence in their territory. Open and semi-structured interviews were utilized. Twelve indigenous of both genres and different ages were interviewed. The interviewees mentioned 36 different mammalian species and they showed wide ecological knowledge regarding these animals. Moreover, oral transmission of knowledge occurs across the generations.

Keywords: mammals, ecology, indigenous Apiaká, Amazon Rainforest

1. INTRODUCTION

Traditional ecological knowledge is a system of knowledge that reflects the adaptation of human populations to their environment. Ethnobiology is the scientific study of dynamic relationships among peoples, biota, and environments. As a multidisciplinary field, ethnobiology integrates archaeology, geography, systematics, population biology, ecology, cultural anthropology, ethnography, pharmacology, nutrition, conservation, and sustainable development. The diversity of perspectives in ethnobiology allows us to examine complex, dynamic interactions between human and natural systems.

The main purpose of this study was to carry out a survey of the knowledge that apiaká natives have about the mammals of natural occurrence in territory, located in the Southern Brazilian Amazon Rainforest.

Much interaction exists between vegetation and fauna, since the majority of tropical tree species are pollinated by animals [1]. Trees attract different species of seed-dispersing frugivorous animals according to the quantity of resources that they offer or because these animals use them as rest areas, nesting grounds or shelter.

A broader conception of non-formal ornithological knowledge of different societies may help formal observers to value local or popular knowledge and relativize the utilitarian and nominal view [2].

2. MATERIALS AND METHODS

The studies were carried out in the Apiaká Indigenous Territory, from 04 to 09 June 2011. The studied territory is located in the Mato Grosso State, Southern Brazilian Amazon Rainforest, at the left margin of river Teles Pires, in the Apiacás municipal district. It lies between 07°39'S to 08°32'S latitude and 57°50'W to 58°21'W longitude, covering an area of 9.820 km².

As method for collect the data were used open and semi-structured interviews. Twelve indigenous were interviewed, with both genres and different ages, all residents of the “aldeia Mayrowy”. According to the sense accomplished in this study, the “aldeia Mayrowy”, the main village of the territory Apiaká, had 118 indigenous in November 2011. The interviewees were chosen through the own indigenous' indications, based on the knowledge of these people on wild mammals. However, not only those who apparently possess such knowledge were interviewed, such as hunters and extractivists who spend much of their time in foray into the forest. The basis of this approach, with the qualitative methodology, encompasses a socio-affective construction of knowledge, since such knowledge is an integral part of the history and reality of the subjects

3. RESULTS AND DISCUSSION

The indigenous interviewees mentioned 36 mammal species of natural occurrence in their territory (Table 1) and they showed wide ecological knowledge regarding these animals. The subsistence hunting for Apiaká is directed to some of these mammals, as the tapir (*Tapirus terrestris*), peccaries (*Pecari tajacu* and *Tayassu pecari*), Spotted Paca (*Cuniculus paca*) and deers (*Mazama americana* and *Blastocercus dichotomus*), by the large size, which implies a higher return of animal protein per unit of hunting effort. Among the primates, there is a preference for the meat of both Guiana Black Spider Monkey (*Ateles paniscus*) and Guianan Brown Tufted Capuchin (*Sapajus apella*).

Some small and medium mammal's species, as the armadillos (*Dasybus novemcinctus* and *Cabassous unicinctus*), capybara (*Hydrochaeris hydrochaeris*), coati (*Nasua nasua*), agouti (*Dasyprocta azarae*) and primates, as the monkey *Alouatta belzebul*, are little hunts despite the abundance and ease of catching these animals. This seems to be related to the great amount of game mammals of large size in the indigenous territory.

Species as the Tapir, the Spotted Paca, the peccaries and the deers were reported as existent and available in great amount. The populations of these mammals' species seem not to be affected for the activities of subsistence hunting that it is realized by Apiaká in a sustainable way.

The Apiaká have lot of knowledge about the ecological importance of the fauna, mainly in the dispersion of seeds of plants that they use in the feeding, as medicines and in the construction of their houses. In this way, as much the hunting as the extractivism of fruits and plants it is realized by Apiaká in a rational way, with little environmental disturbance.

Fruit-eating animals, often related to seed dispersion, are fundamental for the maintenance of the high diversity of tropical plant species [3], and many of these fruits are important in the Apiaká diet. Of the plant species of the Amazon Forest, the majority of plant species very important as fruit producers, and are eaten by diversity of fauna species. The Annonaceae family is one of the most important in the Amazon Forest, and the main genera of it that produce fruit for fauna are *Annona*, *Rollinia*, and *Xylopia*. The *Annona* genus contains various species that produce eatable fruit, like berries, with a large number of seeds, slightly sweet pulp, and a pleasant smell [4].

The Tapir (*Tapirus terrestris*), an herbivore specie of the Tapiridae family, is a disperser of intact Annonaceae seeds in high percentages. It is particularly important in the ecological structure of various species of plants because it can distribute a large quantity and variety of seeds, often acting as a key species. Its absence could cause a breakdown of the key processes in the maintenance of diversity and functioning of the ecosystems [5]. This mammal, whose meat is consumed by Apiaká, is very important in maintaining biodiversity in the ecosystems in which they live since they consume and defecate a wide variety of seed species, the majority of which survive intact and are dispersed in dry land areas distant from the parent plant. According to Fragoso [6], in many cases this maintaining depends on large frugivores, like tapirs, the deer *Mazama americana*, peccaries (*Tayassu pecari* and *Pecari tajacu*), and Spotted Paca (*Cuniculus paca*), all species used by Apiaká as food.

The Myrtaceae is one of the main families used in the apiculture in South America, and is very representative of the Amazon Forest, both in number of species and density of trees and shrubs. Among the main seed dispersers of native species of Myrtaceae in the Amazon (especially the genera *Campomanesia*, *Eugenia*, *Gomidesia*, *Myrcia*, *Myrcianthes*, *Myrciaria*, and *Psidium*), are several species of monkeys, the coati *Nasua Nasua*, the Tapir (*Tapirus terrestris*), the deer *Mazama americana*, the Common Opossum (*Didelphis marsupialis*), several species of rodents such as the agouti *Dasyprocta azarae*, and the *Spotted Paca* (*Cuniculus paca*) [7].

Other very important plant families for frugivores abundant in the Amazon Forest and in the Apiaká indigenous territory are Arecaceae, Burseraceae, Chrysobalanaceae, Euphorbiaceae, Fabaceae, Flacourtiaceae, Lauraceae, Lecythidaceae, Moraceae, Myristicaceae, Myrsinaceae, Sapindaceae, and Sapotaceae, with species that produce large quantities of seeds dispersed by fauna [8].

Animals like the Tapir (*Tapirus terrestris*), the largest terrestrial mammal in South America and present in the Apiaká territory, plays an important role in the dynamic of the environments in which it lives. Terborgh [9] find evidence of the importance of the species of palm tree in the diet of frugivores, such as the tapir. According to the author, populations of *T. terrestris* can be affected by forest fragmentation in the long run, seeing that maintenance of large frugivores depends on the high diversity of plants that have fewer scarce periods.

The fruits of the palm trees *Astrocaryum aculeatum* (tucuma), *Euterpe oleracea* (manicole), *Attalea flexuosa* (morange palm), *Attalea maripa* (maripa), *Oenocarpus bacaba* (bacaba) e *Oenocarpus bataua* (*bataua*), of natural occurrence in the Amazonian are used in the feeding of the Apiaká and they can be related feeding and consequent dispersion for the Tapir and others species of mammals.

Some palm trees of the *Attalea* genus are consumed principally by peccaries (*Pecari tajacu* and *Tayassu pecari*), coatis (*Nasua nasua*), and tapirs (*Tapirus terrestris*), that aid in the dispersion of the seeds of these species. Peccaries consume fruit pulp of multiple palms, such as the *Euterpe oleracea* and *Mauritia flexuosa*, dispersing their seeds [10]. The leaves of *Attalea maripa* and *Mauritia flexuosa* are used in the covering of houses of the Apiaká.

Depending on many plants that are part of their diets [11], primates tend to exercise an important role in the forest ecosystem, principally as seed dispersers, e.g. howler monkeys - *Alouatta* spp [12-14], and capuchin monkeys - *Sapajus* spp [13,15]. Monkeys of the Amazon open large arboreal legume species *Cassia* spp (Fabaceae family) in order to eat the pulp that surrounds the seeds. They also eat various fruit species of the Euphorbiaceae, Loganiaceae, Rubiaceae, and Sapindaceae families, among others.

As with some species of howler monkey (*Alouatta* spp), some Neotropical primates are able to consume more than 100 species of fruit in their diet [13]. The genus *Alouatta* is considered the most folivorous of the Neotropical region [16], but these primates consume large quantities of fruit in the Amazon, exercising an important role as a seed disperser in the biome [13].

Table 1. Species of mammals presented by Apiaká as of natural occurrence in their territory. Nomenclature, taxonomy, Portuguese and English names, and diet: Ca (Carnivore), Fr (Frugivore), Fo (Folivore), Gr (Granivore), Hb (Herbivore grazer), In (Insectivore), Myr (Myrmecophage), On (Omnivore), Ps (Piscivore), Se (Seed predator).

ORDER/Family/ Taxon names	Portuguese name	English name	Diet
DIDELPHIMORPHIA			
Didelphidae			
<i>Didelphis marsupialis</i>	Gambá	Common Opossum	Fr/On
<i>Marmosops parvidens</i>	Cuíca	Delicate Slender Opossum	In/On
XENARTHRA			
Myrmecophagidae			
<i>Tamandua tetradactyla</i>	Tamanduá-mirim	Southern Tamandua	Myr
<i>Myrmecophaga tridactyla</i>	Tamanduá-bandeira	Giant Anteater	Myr

Bradypodidae			
<i>Bradypus variegatus</i>	Preguiça	Brown-throated Sloth	Fo
Dasypodidae			
<i>Dasypus novemcinctus</i>	Tatu-galinha	Nine-banded Armadillo	In/On
<i>Cabassous unicinctus</i>	Tatu-de-rabo-mole	Southern Naked-tailed Armadillo	Myr
<i>Priodontes maximus</i>	Tatu-canastra	Giant Armadillo	In/On
PRIMATES			
Cebidae			
<i>Callicebus cinerascens</i>	Zog-zog	Ashy Titi Monkey	Fr/Fo
<i>Sapajus apella</i>	Macaco-prego	Guianan Brown Tufted Capuchin	Fr/On
<i>Chiropotes albinasus</i>	Cuxiú-de-nariz-branco	White-nosed Saki	Fr/Se
Atelidae			
<i>Ateles paniscus</i>	Macaco-aranha	Guiana Black Spider Monkey	Fr/Fo
<i>Alouatta belzebul</i>	Guariba-de-mãos-ruivas	Red-handed Howler Monkey	Fo/Fr
CARNIVORA			
Canidae			
<i>Cerdocyon thous</i>	Cachorro-do-mato	Crab-eating Fox	In/On
<i>Speothos venaticus</i>	Cachorro-do-mato-vinagre	Bush Dog	Ca
Felidae			
<i>Leopardus pardalis</i>	Jaguaririca	Ocelot	Ca
<i>Panthera onca</i>	Onça-pintada	Jaguar	Ca
<i>Puma concolor</i>	Onça-parda	Cougar	Ca
Mustelidae			
<i>Eira barbara</i>	Papa-mel	Tayra	Fr/On
<i>Lontra longicaudis</i>	Lontra	Neotropical Otter	Ps

<i>Pteronura brasiliensis</i>	Ariranha	Giant Otter	Ps
Procyonidae			
<i>Nasua nasua</i>	Quati	South American Coati	Fr/On
<i>Procyon cancrivorous</i>	Mão-pelada	Crab-eating Raccoon	Fr/On
PERISSODACTYLA			
Tapiridae			
<i>Tapirus terrestris</i>	Anta	South American Tapir	Hb/Fr
ARTIODACTYLA			
Tayassuidae			
<i>Pecari tajacu</i>	Caititu	Collared Peccary	Fr/Hb
<i>Tayassu pecari</i>	Queixada	White-lipped Peccary	Fr/Hb
Cervidae			
<i>Blastocerus dichotomus</i>	Cervo-do-Pantanal	Marsh Deer	Hb
<i>Mazama americana</i>	Veado mateiro	South American Red Brocket	Fr/Hb
RODENTIA			
Sciuridae			
<i>Guerlinguetus ignitus</i>	Quatipuru-pequeno	Bolivian Squirrel	Fr/On
Erethizontidae			
<i>Coendou prehensilis</i>	Porco-espinho	Brazilian Porcupine	Fr/Fo/Se
Caviidae			
<i>Hydrochaeris hydrochaeris</i>	Capivara	Capybara	Hb
<i>Cavia aperea</i>	Preá	Brazilian Guinea Pig	Hb
Dasyproctidae			
<i>Dasyprocta azarae</i>	Cutia	Azara's Agouti	Fr/Gr
Cuniculidae			
<i>Cuniculus paca</i>	Paca	Spotted Paca	Fr/Hb

CETACEA			
Delphinidae			
<i>Sotalia fluviatilis</i>	Tucuxi	Tucuxi	Ps
Iniidae			
<i>Inia geoffrensis</i>	Boto-vermelho	Amazon River Dolphin	Ps

4. CONCLUSION

The diversity of mammals presented by Apiaká of natural occurrence in the indigenous territory was considered large. Apiaká have lot of knowledge about the ecological importance of the fauna. The indigenous knowledge about the ecological interactions between animals and plants travels through generations from older to younger ones in oral transmission.

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