

## Chapter 10

# ***Kixiri* and the Origin of Day and Night: Ethnoprimateology among the Waimiri Atroari Ameindians of the Central Amazonia, Brazil**



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### 10.1 Introduction

Primate species are an integral part of the lives of many Amerindians in Lowland South America (Amazonia). The use of primates as food in Amerindian subsistence hunting practices has been the subject of several studies concerning interactions among human and primate species (Mittermeier 1991; Milton 1991; Prado et al. 2012). Particular emphasis has also been given in the literature to the negative effects of subsistence hunting by indigenous and nonindigenous people on wildlife, in which monkeys represent a special concern (Mittermeier 1987; Queiroz and Kipnis 1990; Peres 1990, 1991; Jerolimski and Peres 2003; Endo et al. 2009; Mena et al. 2000; Souza-Mazurek et al. 2000). The relatively large size of some cebids makes them frequent hunting targets (Emidio-Silva 1998; Mena et al. 2000; Peres 2000). The low reproductivity rate in some species raises concerns about the long-term conservation of large monkeys under heavy hunting pressure, particularly of the genus *Ateles* (Milton 1981). Nevertheless, hunter choices not only follow optimum prey returns but also are influenced by cultural factors (Souza-Mazurek et al. 2000; Lizarralde 2002; Shepard 2002; Cormier 2003). Monkey species are not only an important component of the subsistence diets of many Amazonian indigenous groups as different patterns of hunting and subsistence occur among

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indigenous groups mediated and influenced by symbolic relationships that are culturally established (Da Silva 2005, summarized in Cormier 2006). They are frequently subject to taboos and cultural regulations that often figure in indigenous myth, sacred rites, and social symbologies. Understanding the cultural aspects influencing the relationships that different indigenous people have with nonhuman primates aids in assessing the disruptions of these patterns that occur over time as many of these communities and their territories are undergoing socioeconomic and environmental changes.

There are few ethnobiological studies available about the Waimiri Atroari Amerindians from central Amazonia. Ethnobotanical studies carried out by Miller et al. (1989) and Miliken et al. (1992) indicated that the Waimiri Atroari have extensive knowledge of forest trees, having named 95% of 135 plant species and reported indigenous use of 65% of a sample of 34 species present in the 1 hectare plot of upland forest (*terra firme*). A study carried out by Souza-Mazurek (2001) on subsistence hunting and fishing practices showed that hunting alone is responsible 76% the 143 T total annual offtake of terrestrial vertebrates and fish species combined. As regards the game composition, the Waimiri Atroari select some species including two large cebid species, spider monkey (*Ateles paniscus*) and red howler monkey (*Alouatta macconnelli*), by taking more individuals than expected compared to the natural densities of nonhunted sites (Souza-Mazurek 2001).

In this chapter, we present some aspects of the role of primate species in subsistence practices, myths, cultural taboos, and avoidances as well as medicine in the Waimiri Atroari worldview. Data on primate hunting and consumption stem from the doctoral thesis of the first author, while data on the primate cultural use and symbolism were compiled from the available general literature on the Waimiri Atroari.

## 10.2 The Waimiri Atroari People

The Waimiri Atroari Amerindians refer to themselves as *kinja*, or “true people,” and belong to the Carib linguistic group practicing a hunting/horticultural trekking mode of subsistence. Their homeland is located in the rainforest of central Amazonia, encompassing the valleys of Alalaú, Camanaú, Curiaú, and Santo Antonio do Abonari rivers, in the northern region of Brazil (between 0° and 2° S and 62° and 60° W). The Indigenous Reserve Waimiri Atroari was officially demarcated in 1987 with an area of 2,585,911 hectares (25,859 km<sup>2</sup>). The area traditionally occupied by these Amerindians according to historical records (Bandeira 2009, Barbosa Rodrigues 1885, Monte 1992) also included the area of the Rivers Jauaperi, Urubu, Jatapu, Uatuma, Taruma Açú, Cuieiras, and Apuaú. Stable and peaceful contact with the nonindigenous population was established only since the seventies. Currently the upper portion of Jauaperi River limits the reserve in its northwest side, but it is not part of the Indigenous Land.

The Waimiri Atroari currently have a population of approximately 2013 individuals living in 30 villages scattered along the main river channels and Federal

Highway 174, which connects the cities of Manaus, capital of Amazonas state, and Boa Vista, the capital of in the state of Roraima (Fig. 10.1). The villages are organized around a single hut or communal round house, the *Mydy*, within which the families divide into sectors with a central common area. Around the *Mydy*, there is generally a communal school and a cassava (*Manihot esculenta*) processing house. Centralized power is absent with each village having political and economic autonomy. However, neighboring villages often work together in efforts that involve much labor such as building a *Mydy* or opening new swidden fields. Decisions involving broader issues are made in meetings that bring together all

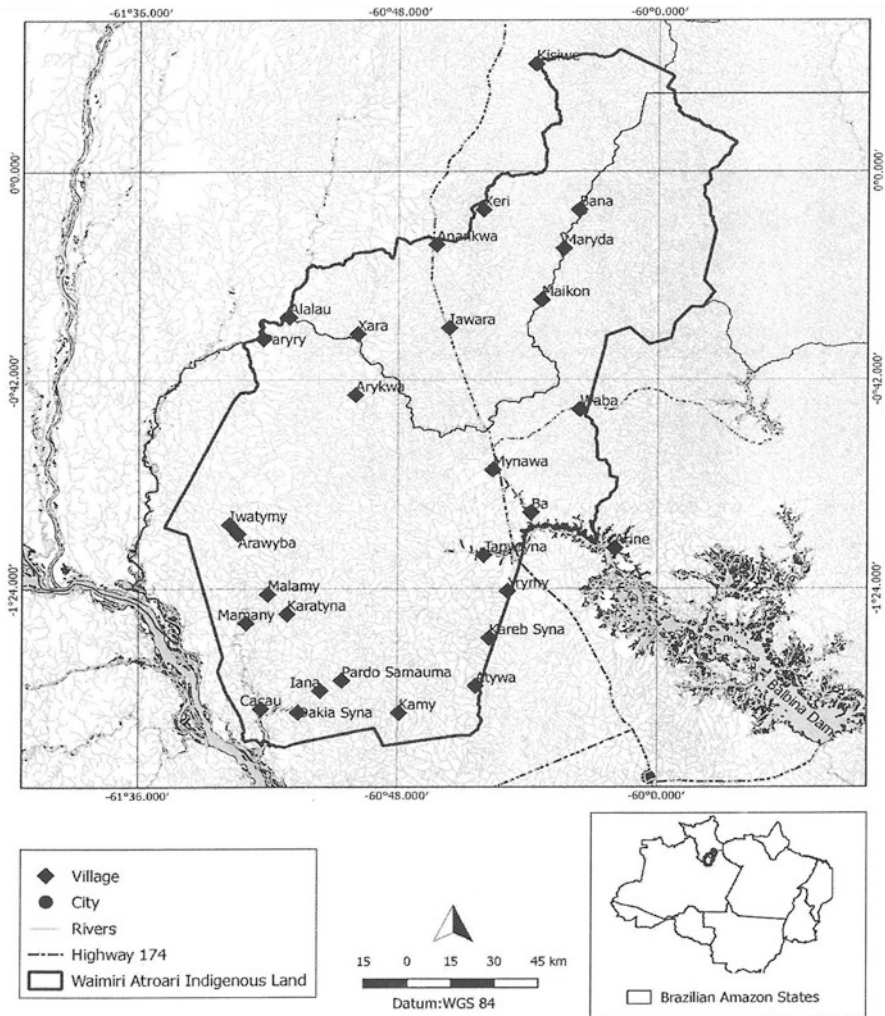


Fig. 10.1 Geographical distribution of the villages within the Waimiri Atoari Indigenous Land. (Source: Ecology Brasil 2014)

the village leaders. Subsistence is based on shifting cultivation, hunting, fishing, and gathering. The main staple of the Waimiri Atroari diet is cassava with both bitter and sweet varieties of this crop being cultivated in swidden fields. Sweet potatoes, yams, sugar cane, pineapples, and other crops are also cultivated. Work is communal, but men and women have distinctive roles: The felling and burning is done by men, while planting is undertaken by both men and women, and harvesting is only done by women (Miliken et al. 1992). Hunting is mostly carried out by men; although, women may hunt small mammals such as red humped agouti (*Dasyprocta agouti*) and red acouchi (*Myoprocta acouchy*), trapping them in hollowed logs (Souza-Mazurek pers. obs.). Hunting yields are split among the hunters in collective hunts, sharing with their relatives and keeping the choice parts of animals for a hunter's immediate family. Fishing is carried out during most of the year, but with more emphasis in the dry season (August to November) by both men and women.

The Waimiri Atroari would traditionally move their villages from time to time as a response to local game scarcity, soil productivity depletion, or political conflicts between families (Silva 1993). However, some changes in settlement patterns from mobile to more sedentary lifestyles have occurred due to a number of external interference in the 1970s and 1980s. A social assistance program for the Waimiri Atroari was established by the state-run power and utility company, ELETRONORTE, and the National Indian Foundation FUNAI (Brazilian agency for Indian affairs). This program helped mitigate the social and environmental impacts they suffered after part of their land was flooded by the Balbina hydroelectric dam's reservoir in 1987. The program provides health assistance, education, and technical support for agricultural production, territorial protection, environmental issues, and documenting the history and cultural heritage of the Waimiri Atroari people. Despite external influences, the Waimiri Atroari retain much of their original culture and obtain many forest resources needed for construction, crafts, and medicines, while still practicing intensively their rituals and ceremonies (Matarezio-Filho 2010; Do Vale 2002; Bruno 2003, 2010, 2014).

### 10.3 Primate Species

Primate surveys of naturally occurring populations carried out in the Rio Negro region of central Amazonia (Trolle 2003) and within the Waimiri Atroari Indigenous Land (Ecology Brasil 2014) recorded the presence of at least 10 species of callitrichids and cebids: *Saguinus midas* (golden-handed tamarin), *Alouatta macconnelli* (red howler monkey), *Ateles paniscus* (Guianan black spider monkey), *Sapajus apella* (Guianan brown capuchin monkey), *Cebus olivaceus* (weeper capuchin), *Cebus albifrons* (white fronted capuchin), *Chiropotes satanas* (brown bearded saki monkey), *Pithecia pithecia* (Guianan saki monkey), and species of the genus *Aotus* (night monkey).

## 10.4 Waimiri Atroari Hunting Practices and the Importance of Primate Species as Food

The Waimiri Atroari Amerindians are agriculturalists that hunt primarily for food consumption (Souza-Mazurek et al. 2000). They are active “central place” foragers and rarely hunt for more than one day per trip; the exception to this is during ritual hunts, when hunting groups travel to specific areas and hunt and smoke slain animals for days or weeks to ensure enough food for large amounts of people participating in the ritual gathering. Most hunters use bows and arrows, although a small number have shotguns, regularly, and at least one man carries a gun per hunting group (Souza-Mazurek, pers. obs.). The group size of hunters is variable but averages around five people, and each hunter carries a weapon. Hunting events are mostly diurnal and consist of using trails from the village on foot or taking boats or trucks to reach more distant known hunting spots. Hunting groups walk along the trail looking for animal tracks and often imitate animal sounds, particularly black spider monkey and tapir (*Tapirus terrestris*) (Souza-Mazurek pers. obs.).

In the case of primates, once a troop is encountered in trees, hunters jockey to encircle them. In turn, each hunter then chooses an individual target in the troop and shoots upward, nearly vertically, from below. Individual hunters disperse to chase monkeys that have escaped in different directions after the initial group shooting attempt (Souza-Mazurek pers. obs.).

Monkeys are an important part of the diet of the Waimiri Atroari Amerindians. Three cebid species represented 24.5% of the total vertebrates ( $N = 5537$  individuals) and 35% of all individual mammals hunted ( $N = 3841$ ). Red howler monkey ( $n = 638$ ) ranked first followed by Guianan black spider monkey ( $n = 615$ ) and Guianan brown capuchin monkey ( $n = 99$ ). Red howler monkey and Guianan black spider monkey are the largest monkey species occurring in the area (Fig. 10.2).



**Fig. 10.2** Individuals of Guianan black spider monkey and red howler monkey killed during hunts by Waimiri Atroari

The three primate species together contributed with 8.9% of the total vertebrate biomass of 110 tons extracted over a 14-month period in the hunting catchment of 5000 km<sup>2</sup> (Souza-Mazurek 2001). More males than females of Guianan brown capuchin monkey and red howler monkey were hunted by the Waimiri Atroari. In the case of the spider monkey, the sex ratio of female biased in a proportion of 3:1.

#### 10.4.1 Food Avoidance and Primate Medicinal Use

Taboos and temporal avoidance of certain primate species are related to the cosmology and cultural symbolism of the social order of a particular indigenous group. Certain species are not consumed because, culturally, they are not considered “human food,” while others are not caught because they are believed to pose serious health and life threats to those who eat them because of their powerful spiritual strength. Additionally, other species are not eaten due to unwanted characteristics of the animals that can be transmitted to the person who consumes them or to his relatives. In the case of the Wamiri Atroari, these characteristics can include morphology and behavioral and/or feeding habits (Espinola 1995). Among the primate species not considered food by the Waimiri Atroari are golden-handed tamarin, common squirrel monkey, Guianan saki monkey, white fronted capuchin, and night monkey.

Some animal species including primates may be also avoided because they were *Kinja* (human beings) in mythical times before being transformed into animals by their own will or by the will of others. According to some myths recorded by Espinola (1995), in the past, it was prohibited to hunt Guianan black spider monkey because it was *Kinja* and considered a *yaska* or “relative” of the Waimiri Atroari. Those failing to follow the prohibition exposed themselves to the risk of early aging. Nevertheless, golden-handed tamarin which is a mythical figure and was also *Kinja* was often hunted for food together with other small-sized species.

In several cases, the consequences of eating forbidden animals affect the relatives of the person who violated this proscription more than the individual breaking the rule. Food interdictions are not permanent as people are more vulnerable in particular moments of their life cycles, such as pregnancy, primogeniture status, menarche, and during initiation rituals, when prescribed protocols are in order. Primate species are often avoided during pregnancy and the first years of the first-born children, particularly affecting the father of such children in the event he would break such rules. Likewise, Guianan black spider monkey cannot be hunted or eaten by men whose wives are pregnant, during the whole gestational period. This prohibition is extended over to the first month after childbirth, the same procedure is applied to the consumption of red howler monkey. In the case of second-born children, Guianan black spider monkey can already be eaten by the husband in the first month after childbirth but must still apply with regard to red howler monkeys and capuchins. If a howler monkey is consumed by the father, then the baby will grow a big belly or will have parasitic worms in the case of consuming capuchin monkeys.

In the case of first menses, food taboos for the young woman include Guianan brown capuchin monkeys along with other animals such as peacock bass, *pintado* (a cat fish species), redbtail catfish, tapirs, tortoises, sting rays, red macaws, and also sugar cane (Espinola 1995). If the feeding rules are not respected, then the menstruation bleeding might never stop or the girl can become *Yaweri* (mentally disturbed and violent).

#### 10.4.2 *Primates in Myths and Rituals*

The cultural perception of the world and its elements includes myths and relationships among human and nonhuman beings. According to Levi-Strauss and Eribon (1988: 193), “myths represent histories from a time when the differences between human and not human beings were not distinct.” To the Waimiri Atroari, several animal species including the primates Guianan black spider monkey, golden-handed tamarin, and Guianan brown capuchin monkey were *kinja* (people) in the stories from the mythical times (*tahkome ikaa* – ancient stories), but were transformed voluntarily or as a punishment by a superior being into monkeys as a consequence of socially reprehensible attitudes. As in many Amerindian groups, the cultural universe of the Waimiri Atroari is also inhabited by human and nonhuman entities. Viveiros de Castro (2002a: 354) describes “an ontological intertwining of these beings that inhabit indigenous myths in that human and non-human aspects are entangled. Human beings are those who remained as humans, as such, animals are ex-humans and humans are ex-animals. It is possible to perceive that the indigenous cosmologies involve an ongoing engagement of alliances, relations, and disputes between human and non-humans.”

The Waimiri Atroari myth *Wyie ika nenuwe many xiriki many* – history of the sun, the moon, and the stars – explains how the daily movement of the sun in the sky is perceived, and the origin of day and night, at a time when the golden-handed tamarin was still human, plays an essential part in showing these dynamics: “In ancient times there was no sunset and it was never dark. The Amerindians of that time would hunt all the time because they ate all the time because there was no night. The moon and the stars looked like the sun. When the sun was going to set the owner of the sun (*Mawa*, Waimiri Atroari mythical being) would send it back, to do the reverse path in the sky. One day the *Xiriki* (*Saguinus midas*), in a time when he was still a person, broke the sun. He wanted to find out what was inside the sun, because the sun was like a clock with a juice inside that made it work. Once the sun was broken it became dark and the hunters who were away hunting could not return to the village and stayed in the forest. *Xiriki* broke the Sun when the owner of the Sun was just arriving. ‘You broke the sun! Why did you touch the sun?’ asked the owner of the sun before throwing the little monkey away. *Xiriki* was a person before he broke the sun but the owner of the sun transformed him into a monkey with golden hands because he touched the juice of the sun” (*Wyie ika nenuwe many xiriki many* – history of the sun, the moon, and the stars told by Dauna Elzo in Fonseca and Fonseca, unpubl. Inf.)

After the sun had been broken by *Xiriki*, the narrative continues to describe the attempts by *Mawa*, the sun's owner, to fix the sun until reaching partial success. As only one side of the sun was fixed, *Mawa* made the moon and stars work on the other side, giving origin to the night, with alternate time periods. *Xiriki* was punished by *Mawa* to remind him of his inappropriate behavior.

### 10.4.3 *Primates and the Maryba Rituals*

One of the supports of the Waimiri Atroari culture is the group of *Maryba* rituals. According to Do Vale (2002), who studied the ritual, the word *Maryba* can be translated as feast, song, or dance. It is a moment when the communities suspend everyday existence and transport themselves to another time and space. They are important sociopolitical moments for the Waimiri Atroari as it is a time when people from all villages gather to establish and reaffirm alliances between themselves. There are three main *Maryba* rituals performed by the Waimiri Atroari: one associated with the deceased (*Johy Maryba*), a second when a new communal hut is built (*Mydy Maryba*), and one for the male initiation rites (*Bahinja Maryba*) when boys are between ages of 3 and 5 years old. The *Bahinja Maryba* ritual lasts three days and two nights. During the three days of the *Bahinja Maryba*, the attributes, skills, power, behavior, and ecological aspects of animal species, cultivated and wild plants, and their byproducts are evoked, sang about, and performed through dances by the participants guided by the *Eremy* (a ritual singer). According to Do Vale (2002), the *Eremy* represents the links between the Waimiri Atroari with their spiritual world and mythical past. Through the songs and dances, the *Eremy* leads the Waimiri Atroari and establishes relationships involving the present and mythical times, uniting nature and culture. The dances and chanting are entwined forming a single whole implying that both song and choreography need to be known in order to be performed.

It is during the *Maryba* that the symbolic, cultural, and material worlds of the Waimiri Atroari come together. The dance sequences and instrument and music performances present all the symbolic food items (game species, fruits, and tubers) consumed during the ritual, connecting the parents of the initiated boys, the guests, and the nonhuman entities who are evoked throughout the three-day event. It is possible to perceive that indigenous cosmologies encompass the presence, alliances, and disputes between human and nonhuman beings. Viveiros de Castro (2002b) highlights that the perspectivism theory must be understood from a relational instead of relative perspective. In that sense, the real world of the different species depends on their own particular points of view since the world is composed by individual species. The *Maryba* rituals reflect the cultural symbolism of the everyday life of the Waimiri Atroari, during which time the boy being initiated acquires the knowledge about the wildlife, the forest plant species, the danger, the cultural roles, and obligations expressed by the chants. The human and social conditions for being a Waimiri Atroari person are linked to specific prescriptions such as eating banana



porridge (considered human food or *Kinja ipa*), singing and dancing the *Maryba*, marrying only among themselves, accepting food taboos and avoidances, and speaking their own language (*Kinja lara*) (Matarezio-Filho 2010).

Primates are among the several animal species evoked by the Waimiri Atroari by the *Eremy* during the *Bahinja Maryba* initiation ritual. The songs and behavior of the animal species are performed throughout the ritual, representing the way of being and the set of affection and abilities that characterized each of them as they are perceived as conceived by Viveiros de Castro (2002b). The jaguar (*Felis onca*) and the harpy eagle (*Harpia harpija*) are important figures in the ritual and are the first spirits evoked (Do Vale 2002). They are perceived only by the boys being initiated and the *Eremy*. The *Eremy* assumes and represents the behavior of the jaguar through singing and dynamic dancing performances. The Jaguar will protect the whole existence of the young hunter preventing him from feeling fear in the face of threats. The Guianan black spider monkey and Guianan brown capuchin are represented in the *Bahinja Maryba* songs among the fourteen mammals, seven birds, three reptiles, two fish, and two insect species. Some aspects of the ecology of black spider monkey are described in this chant: "... the song tells how the *kwata* (*Ateles paniscus*) eats, how it moves through the trees. The song tells how it eats in the thorny *tucumã* palm tree (*Astrocaryum aculeatum*), and eats *açaí* palm (*Euterpe precatória*) leaves, which are monkeys' food. I learned that until the end of the *Maryba* monkey dance, when all people cross the hut eating from one side to the other imitating how the monkey eats" (Sekymy Pedrosa, pers. comm. to Do Vale 2002: 65).

The song of the *Meky* (*Sapajus apella*) describes the noisy and libidinous behavior of the primate species as perceived by Amerindians. It is performed prior and to counteract with the chant about the precepts of sexual morality of the Waimiri Atroari, having an important role in the ritual process of male initiation. During the *Meky Maryba*, the *Eremy* conducting the ritual requests that the boy's parents bring bracelets made of *karwa* fiber (*Ananas erectifolius*) and Guianan brown capuchin monkey teeth to be tied at the initiates' ankles. The anklets aim to protect the bodies of the boys during the *Behe* or "ritual whipping" that occurs at dawn of the third and final day of the male initiation ritual (Do Vale 2002).

## 10.5 Discussion

Throughout this chapter, we described some aspects of the ethnoprimateology of the Waimiri Atroari. Primate species, particularly cebids, represent an important source of food for the Waimiri Atroari, and they are hunted in larger numbers compared to other Carib speakers (Hames 1979; Milton 1991; Mittermeier 1991; Linke 2009) and other indigenous groups (Vickers 1991; Ouhoud-Renoux 1998; Cormier 2003; Prado et al. 2012).

The Waimiri Atroari focus most of their primate hunting on red howler monkey, Guianan black spider monkey, and Guianan brown capuchin monkey, and the first

two are the largest species present in the study area. There is a preference for hunting the males of Guianan brown capuchin monkey and red howler monkey, and these returns do not correspond to the natural sex ratio found in un hunted population of these species (Rudran and Fernandez-Duque 2003; Carosi et al. 2005; Izawa 1980; Fragaszy et al. 2004; Queiroz 1995). The observed preference for red howler monkey and Guianan brown capuchin monkey males suggests that body size might play a role in hunters' choices among the primate species items that are considered "human food." Males are larger than females in both species (Crockett and Eisenberg 1987; Thorington et al. 1979; Souza-Mazurek unpubl. data). In the case of Guianan black spider monkey, hunting returns were biased toward females in a 3:1 ratio among hunted individuals, although the species lack body size sexual dimorphism (Souza-Mazurek 2001). Some of the observed patterns of use of primate species as food may have additional explanations besides hunting returns based on their body size or their natural availability. Females are targeted first when a group is found, and the Waimiri Atroari claim that females are considered "tastier" as they have more body fat than males. In spite of this slight preference, males are also frequently chased by the Waimiri Atroari (Souza-Mazurek pers. obs.), revealing that while females are preferred, prey males are not rejected. The Wayana and Aparai Amerindians from the same linguistic group as the Waimiri Atroari and the Matsigenka Amerindians of the Peruvian Amazon region also present female-biased sex ratio hunting returns for spider monkeys (Linke 2009; Da Silva et al. 2005). In all these cases studied, the pattern is explained by cultural beliefs according to the social order of each group. The Matsigenka believe that certain monkeys (especially large adult males) and other game animals may pose serious health and life threats to those who eat them due to their powerful spiritual strength. Their vengeful spirits can "take revenge" on the hunter's family, causing illness among young children (Da Silva et al. 2005). The Wayana and Aparai avoid hunting male spider monkeys to prevent them from becoming bad hunters (Linke 2009). Nevertheless, female-biased sex ratios in Guianan black spider monkey are also documented in their natural population (van Roosmalen 1985; Symington 1987) which could also be reflected in hunting returns in the absence of strong, culturally established avoidances.

Primates fulfill other cultural roles and are not only seen as a source of food. Temporal avoidances of primate species are present for the three most consumed cebid species and are mostly related to periods of pregnancy and postpartum periods and affect the husband in the case of the Waimiri Atroari. The Tapirapé present similar avoidances concerning *A. macconnelli* (Wagley 1983) and among the Shipibo postpartum temporal restriction for *Cebus* for both parents (Behrens 1986). *A. paniscus* temporal avoidance is less common among other Amazonian indigenous groups, when compared to species of the genus *Alouatta*. The Tupi speaker Wapishana hunt eight species of monkeys, including howlers, but the prohibition applies only to spider monkeys (Henfrey 2002). Nevertheless, primates are also present in rituals and participate in important myths with multiple symbolic significances for the social and cultural order of the Waimiri Atroari.

The *Wye ika nenuwe many xiriki many* myth explains the origin of observed natural astronomical phenomena of the day and night among the Waimiri Atroari. It reminds them today that since ancient times, the appearance of stars in the celestial rain constellation guided them to prepare their agricultural fields, at a time when stone axes were used to fell trees and were sharpened with the teeth of spotted pacas (*Cuniculus paca*) and collared peccaries (*Tayassu tajacu*). In the same myth, the Amerindian is transformed into a monkey with golden hands (*Saguinus midas*) due to a culturally repugnant and reprehensible human attitude, with the ensuing punishment. The myth also provides elements that explain the presence of an evident phenotypical features of the golden-handed tamarin. Similarly, the Awá-Guajá share complex social relationships with primates including golden-handed tamarin (Cormier 2003).

Primate body parts are used in magical, and religious rituals make amulets to protect their users. Anklets made of teeth of *Sapajus* are tied around the ankle of infants Waimiri Atroari to protect their bodies during the whipping that is part of the male initiation rite. Hanson-Alp et al. (2003) reported similar uses of chimpanzee central incisors around the waist of infants in Sierra Leone as amulets to protect them and give them power over others in their cohort.

Species of the genus *Alouatta* are frequently present in the cosmology of several Amerindian groups of Amazonia (reviewed in Urbani and Cormier 2015). Among the Awá-Guajá, howler monkeys were once human beings who were transformed into monkeys so that other humans would be able to eat and survive. Howlers are said to be like humans because they “sing,” which is intrinsically the way the Awá-Guajá travel into the spirit world (Cormier 2003). Among the Waimiri Atroari, red howler monkey symbolically appears as subject of temporal food avoidance. In the past, the Waimiri Atroari also avoided hunting the Guianan black spider monkey because it was once a human being and considered their relative, but this same symbolic role associated to the golden-handed tamarin did not seem to impose food restrictions. Conversely, in present days, Guianan spider monkeys and other medium- to large-sized primates are heavily hunted, while the golden tamarin is never found among hunted items (Souza-Mazurek et al. 2000, Souza-Mazurek 2001).

Some of the cultural patterns for the primate species described here are shared with other Amazonian groups (Shepard 2002, Da Silva et al. 2005). Nevertheless, there are more ethnozooological information available on subsistence hunting and its effects on primate populations than on other cultural aspects of the relationship among human–nonhuman primates for the Waimiri Atroari, as it is true for other indigenous people (see compilations in Urbani [2005] and Cormier [2006]). The impacts of the observed extraction levels and selective hunting pattern on the primate species population within the Waimiri Atroari territorial context is currently under analysis (Souza-Mazurek et al. unpubl. data). Additionally, another problem-directed research effort may reveal other relevant cultural aspects of the relationship between the Waimiri Atroari and the nonhuman primate species occurring in the shared region.

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## References

- Bandeira A (2009) Jauapery. Edua, Manaus
- Barbosa Rodrigues J (1885) Pacificação do Crichanás. Imprensa Nacional, Rio de Janeiro
- Behrens CA (1986) Shipibo food categorization and preference: relationships between indigenous and Western dietary concepts. *Am Anthropol* 88:647–658
- Bruno AC (2003) Waimiri-Atroari grammar: some phonological, morphological, and syntactic aspects. Ph.D. Dissertation, University of Arizona, Tucson
- Bruno AC (2010) “How can I write my language?” Linguistic analysis and language revitalization: lessons from Waimiri Atroari syllable structure. *Liames* 10:85–99
- Bruno AC (2014) (org) *Vozes da Floresta: a arte de contar histórias – Histórias do Passado e do Cotidiano Indígena*. Editora INPA, Manaus
- Carosi M, Linn GS, Visalberghi E (2005) The sexual behavior and breeding system of tufted capuchin monkeys (*Cebus apella*). *Adv Study Behav* 35:105–149
- Cormier LA (2003) Kinship with monkeys: the Guajá Foragers of Eastern Amazonia. Columbia University Press, New York
- Cormier LA (2006) A preliminary review of Neotropical primates in subsistence and symbolism of indigenous lowland South American peoples. *Ecol Environ Anthropol* 2:14–32
- Da Silva MNF, Shepard GH Jr, Yu DW (2005) Conservation implications of primates hunting practices among the Matsigenka of Manu National Park. *Neotrop Primates* 13(2):31–36
- Do Vale MCR (2002). Waimiri-Atroari em festa é Maryba na floresta. Master thesis, Universidade do Amazonas, Amazonas
- Crockett CM, Eisenberg JF (1987) Howlers: variations in group size and demography. In: Smuts BB, Cheney DL, Seyfarth RM, Wrangham RW, Struhsaker TT (eds) *Primate societies*. The University of Chicago Press, Chicago, pp 54–68
- Endo W, Peres C, Salas E, Mori S, Sanchez-Vega JL, Shepard G et al (2009) Game vertebrate densities in hunted and non hunted forest sites in Manu National Park, Peru. *Biotropica* 42(2):251–261
- Espinola CV (1995) O Sistema Médico Waimiri-Atroari: Concepções e Práticas, Master Thesis. PPGAS-UFSC, Florianópolis
- Emídio-Silva C (1998) A caça de subsistência praticada pelos índios Parakanã (sudeste do Pará): características e sustentabilidade. Master Dissertation. Museu Paraense Emílio Goeldi & Empresa Brasileira de Pesquisa Agropecuária, Belém
- Fragaszy D, Visalberghi E, Fedigan L (2004) The complete capuchin: the biology of the *genus Cebus*. Cambridge University Press, Cambridge
- Jerozolinski A, Peres C (2003) Bringing home the biggest bacon: a cross-site analysis of the structure of hunter-kill profiles in Neotropical forests. *Biol Conserv* 111(3):415–425
- Hames RB (1979) A comparison of the efficiencies of the shotgun and the bow in neotropical forest hunting. *Hum Ecol* 7:219–252
- Hanson-Alp R, Bakarr MI, Lebbie A, Bangura KI (2003) Sierra Leone. In: Kormos R, Boesch C, Bakarr M, Butynski T (eds) *West African chimpanzees: status survey and conservation action plan*. IUCN/SSC Primate Specialist Group, Gland, pp 77–87
- Henfrey TB (2002) Ethnoecology, resource use, conservation, and development in a Wapishana Community in South Rupununi, Guyana. Ph.D. dissertation. University of Kent, Canterbury

- Izawa K (1980) Social behavior of the wild black capped capuchin *Cebus apella*. *Primates* 21(4):443–467
- Lévi-Strauss C, Eribom D (1988) De perto e de longe: entrevista com Claude Lévi-Strauss. Nova Fronteira, Rio de Janeiro
- Linke IHV (2009) Caracterização do uso da fauna cinegética em aldeias das etnias Wayana e Aparai na terra indígena Parque do Tumucumaque, Pará. Master Thesis. Museu Paraense Emílio Goeldi, Belém
- Lizarralde M (2002) Ethnoecology of monkeys among the Barí of Venezuela: perception, use, and conservation. In: Fuentes A, Wolfe LD (eds) *Primates face to face: the conservation implications of human-nonhuman primate interconnections*. Cambridge University Press, Cambridge, pp 85–100
- Matarezo-Filho ET (2010) Ritual e Pessoa entre os Waimiri Atroari. Master Thesis. University of São Paulo, São Paulo
- Mena VP, Stallings JR, Regalado JB, Cueva RL (2000) The sustainability of current hunting practices by the Huaorani. In: Robinson J, Bennett E (eds) *Hunting for sustainability in tropical forests*. Columbia University Press, New York, pp 57–78
- Miliken W, Miller RP, Pollard S, Wandeli EV (1992) Ethnobotany of the Waimiri Atroari Amerindians. Royal Botanic Gardens, Kew
- Milton K (1981) Estimate of reproductive parameters for free ranging *Ateles geoffroyi*. *Primates* 22:574–579
- Milton K (1991) Comparative aspects of diet in Amazonian forest-dwellers. *Philos Trans R Soc Lond Ser B Biol Sci* 334:253–263
- Miller RP, Wandelli EV, Grenand P (1989) Conhecimento e utilização da floresta pelos índios Waimiri Atroari do Rio Camanaú, Amazonas (I). *Acta Bot Bras* 3(2) Supl 47–56
- Mittermeier RA (1987) Effects of hunting on rain forest Primates. In: Marsh CW, Mittermeier RA (eds) *Primate conservation in the tropical rain forest*. Alan Liss Inc, New York, pp 109–146
- Mittermeier RA (1991) Hunting and its effect on wild primates populations in Suriname. In: Robinson JG, Redford KH (eds) *Neotropical wildlife use and conservation*. University of Chicago Press, Chicago, pp 93–107
- Monte PP (1992) Etno-história Waimiri Atroari (1883–1962). Master Dissertation, Pontifícia Universidade Católica de São Paulo, São Paulo
- Ouhoud-Renoux F (1998) Se nourrir à trois sauts analyse diachronique de la prédation chez les wayâpi du haut-oyapock (guyane française). *JATBA, Revue d'ethnobiologie* 40(1–2):181–206
- Peres C (1990) Effects of hunting on western Amazonian primate communities. *Biol Conserv* 54:47–59
- Peres C (1991) Humbolt's woolly monkeys decimated by hunting in Amazonia. *Oryx* 25:89–95
- Peres C (2000) Evaluating the impact and sustainability of sustainable hunting at multiple Amazonian forest sites. In: Robinson JG, Bennett EL (eds) *Hunting for sustainability in tropical forests*. Columbia University Press, New York, pp 31–56
- Prado HM, Forline LC, Kipnis R (2012) Hunting practices among the Awá-Guajá: towards a long-term analysis of sustainability in an Amazonian indigenous community. *Bol Mus Para Emílio Goeldi Cienc Hum* 7(2):479–491
- Queiroz HL (1995) Preguiças e guaribas: os mamíferos folívoros arborícolas do Mamirauá. Sociedade Civil Mamirauá/MCT/CNPq, Distrito Federal, Brasília
- Queiroz HL, Kipnis K (1990) Os índios Awá-Guajá e os primatas da Amazônia maranhense: um caso de sustentabilidade de caça. In: Ferrari SF, Schneider H (eds) *A Primatologia no Brasil*. Universidade Federal do Pará, Belém, pp 81–94
- Rudran R, Fernandez-Duque E (2003) Demographic changes over thirty years in a red howler population in Venezuela. *Int J Primat* 24:925–947
- Shepard GHJ (2002) Primates in Matsigenka subsistence and worldview. In: Fuentes A, Wolfe LD (eds) *Primates face to face: the conservation implications of human-nonhuman primate interconnections*. Cambridge University Press, Cambridge, pp 101–133
- Silva MF (1993) Romance de primos e primas: uma etnografia do parentesco Waimiri Atroari. Ph.D Thesis Social Anthropology. Universidade Federal do Rio de Janeiro/Museu Nacional, Rio de Janeiro

- Souza-Mazurek RR, Pedrinho T, Feliciano X, Hilario W, Geroncio S, Marcelo E (2000) Subsistence hunting among the Waimiri Atroari Amerindians in Central Amazonia. *Brazil Biodivers Conserv* 5(5):579–596
- Souza-Mazurek RR (2001) Kinja Txi Taka Nukwa Myrykwase: fishing and hunting among the Waimiri Atroari Amerindians from Central Amazonia. PhD Dissertation. University of Illinois at Chicago, Chicago
- Symington MM (1987) Sex ratio and maternal rank in wild spider monkeys: when daughters disperse. *Behav Ecol and Sociobiol* 20:421–425
- Thorington-Jr RW, Rundran R, Mack D (1979) Sexual dimorphism in *Alouatta macconnelli* and observations in capture techniques. In: Eisenberg JF (ed) *Vertebrate ecology in the northern Neotropics*. Smithsonian Institution Press, Washington, pp 97–106
- Trolle M (2003) Mammal survey in the Jauaperi river region, rio Negro Basin, the Amazon, Brazil. *Mamalia*, t. 67. n° 1, 75–83
- Urbani BL (2005) The targeted monkey: a re-evaluation of predation on New World primates. *J Anthropol Sci* 83:89–109
- Urbani BL, Cormier LA (2015) The ethnoprimateology of the howler monkeys (*Alouatta* spp.): from past to present. In: Kowalewski MM et al (eds) *Howler monkeys, developments in primatology: progress and prospects*. Springer Science + Business Media, New York
- van Roosmalen MGM (1985) Habitat preferences, diet, feeding strategy and social organization of the black spider monkey (*Ateles paniscus paniscus* Linnaeus 1758) in Surinam. *Acta Amaz* 15:1–238
- Vickers W (1991) Hunting yields and game composition over ten years in an Amazonian Indian territory. In: Robinson JG, Redford KH (eds) *Neotropical wildlife use and conservation*. University of Chicago, Chicago, pp 53–81
- Viveiros de Castro E (2002a) *Imagens da Natureza e da Sociedade*. In: Viveiros de Castro E (ed) *A Inconstância da alma selvagem e outros ensaios de Antropologia*. Cosac&Naify, São Paulo, pp 310–344
- Viveiros de Castro E (2002b) *Perspectivismo e Multinaturalismo na América Indígena*. In: Viveiros de Castro E (ed) *A Inconstância da alma selvagem e outros ensaios de Antropologia*. Cosac&Naify, São Paulo, pp 225–254
- Wagley C (1983) *Welcome of tears, the Tapirapé Indians of Central Brazil*. Prospect. Waveland Press, Heights