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USE OF PLANT SPECIES IN THE TREATMENT AND CURE OF DISEASES BY THE TENHARIM INDIGENOUS IN THE AMAZON

Uso de espécies vegetais no tratamento e cura de doenças pelos indígenas tenharim na Amazônia

Uso de especies de plantas en el tratamiento y cura de enfermedades por parte de los indígenas tenharim en la selva amazónica brasileña

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SUMMARY

In this ethnobotany study carried out in the Tenharim indigenous territory, located in the interior of the State of Amazonas, Brazil, it was verified, through interviews, the use of more than 300 species of plants, the majority of which occur naturally in the Amazon biome and others introduced for various purposes, such as medicinal, food, crafts, firewood, utensils and buildings in general. Among this great plant diversity, 104 species are used in prophylactic and curative medicine by these indigenous people. The objective of this study was to carry out a survey of the knowledge that the Tenharim has about the existing vegetation in their territory. The data collection method used was open and semi-structured interviews. The knowledge of plants and the relationship of human beings with nature are not passed on or learned systematically and formally among these indigenous peoples, and few people have this knowledge. The large variety of registered plant species demonstrated that the use of plants is very comprehensive and important in the cultural and ecological survival of the Tenharim.

Keywords: Ethnobotany; Traditional communities; Indigenous peoples of the Amazon.

RESUMO

Neste estudo de etnobotânica realizado em território indígena Tenharim, localizado no interior do estado do Amazonas, Brasil, constatou-se, através de entrevistas, a utilização de mais de 300 espécies vegetais, sendo a maioria de ocorrência natural do bioma Amazônia e outras introduzidas para diversas finalidades, como medicinal, alimento, artesanato, lenha, utensílios e construções em geral. Entre esta grande diversidade vegetal, 104 espécies são utilizadas na medicina profilática e curativa

destes indígenas. O objetivo deste estudo foi realizar um levantamento do conhecimento que os tenharim possuem sobre a vegetação existente no seu território. O método de coleta de dados utilizado foram entrevistas abertas e semiestruturadas. O conhecimento das plantas e a relação dos seres humanos com a natureza não são passados e nem aprendidos de maneira sistemática e formal entre estes indígenas e são poucos os detentores destes conhecimentos. A grande variedade de espécies vegetais registradas demonstrou que o uso das plantas é bem abrangente e muito importante na sobrevivência cultural e ecológica dos Tenharim.

Palavras-chave: Etnobotânica; Comunidades tradicionais; Indígenas da Amazônia.

RESUMEN

En este estudio de etnobotánica realizado en territorio indígena Tenharim, ubicado en el interior del estado de Amazonas, Brasil, se constató, a través de entrevistas, la utilización de más de 300 especies vegetales, siendo la mayoría de ocurrencia natural del bioma Amazonia y otras introducidas para diversas finalidades, como medicinal, alimento, artesanía, leña, utensilios y construcciones diversas. Entre esta gran diversidad vegetal, 104 especies se utilizan en la medicina profiláctica y curativa de estos indígenas. El objetivo de este estudio fue realizar un levantamiento del conocimiento que los Tenharim poseen sobre la vegetación existente en su territorio. Como método de recolección de datos fueran utilizadas entrevistas abiertas semiestructuradas. El conocimiento de las plantas y la relación de la humanidad con la naturaleza no son pasados ni aprendidos de manera sistemática y formal entre estos indígenas y son pocos los poseedores de estos conocimientos. La gran variedad de especies vegetales registradas demostró que el uso de las plantas es muy amplio y muy importante en la supervivencia cultural y ecológica de los Tenharim.

Palabras-clave: Etnobotánica; Comunidades tradicionales; Indígenas de la Amazonia.

1 INTRODUCTION

The use of plant species to treat and cure diseases and their symptoms has been perpetuated in the history of human civilization and has reached the present day, being widely used by a large part of the world's population as an effective therapeutic source. Medicinal plants are any and all plants that, once applied in a certain way and by some means to humans, are capable of promoting a pharmacological effect (SALVI; HEUSER, 2008).

Ethnobotany is the science linked to botany and anthropology, which studies the interactions between plants and human societies, in dynamic systems, also consisting in understanding the traditional uses and applications of plants by them. It is a multidisciplinary science encompassing botanical, anthropological, pharmacological, ecological, and linguistic knowledge (ALCORN, 1995).

Traditional ecological knowledge is a knowledge system that reflects the adaptation of human populations to their environments. Ethnobotany has contributed not only to rescuing traditional knowledge, which is in the process of being lost due to the clash with

the dominant culture but also to rescuing and valuing the very values of the cultures with which it comes into contact. It has also supported minority ethnic groups in the fight against the undue intellectual appropriation of knowledge of the therapeutic properties of medicinal plants by economic groups, which register active principles as private property, in contrast to the traditional information that was given to them free of charge (MINNIS, 2000).

Comprehensive knowledge of indigenous practices concerning vegetation can be obtained through ethnobiological studies. Among the approaches that have contributed most to the study of knowledge of traditional populations are ethnosciences, which are based on linguistics to study the knowledge of human populations about natural processes, trying to discover the underlying logic of human knowledge of the natural world, taxonomies and total classifications (DIEGUES et al., 2000).

The main objective of this study was to identify the diversity of plant species used in the treatment and cure of diseases by the indigenous, from the Tenharim Marmelos Indigenous Land, located in the Southern Amazon Mesoregion, Microregion of the Madeira River, in the municipalities of Humaitá and Manicoré, State of Amazonas, Brazil and highlight the importance of the knowledge of these indigenous people in contributing to science. It is expected that these ethnobotanical investigations will contribute to the conservation of the biological and cultural diversity of the region studied, to the understanding of different aspects of human behavior, such as survival strategies and adaptation to the environment, classification, management and conservation of natural resources, in the various ways of transmitting knowledge, supporting and strengthening relations of kinship among members of the studied community.

Tenharim is the name given by non-indigenous peoples to one of several Kagwahiva indigenous groups that live in the extensive basin of the Madeira River, in the Amazon biome. These groups, even though they live in geographically distant regions, recognize themselves as Kagwahiva and have in common, in addition to the Tupi-Kagwahiva language, the historical process of displacement from the Tapajós River basin to the Madeira River basin and the social organization that presents a system of exogamous moieties.

“Every *kagwahiva* belongs by birth and for life to one of these two moieties, which determines the domain of the person within the local group, such as descent, marriage, residence group, and workgroup” (MENÉNDEZ, 1989, p. 8).

The system of matrimonial moieties is structured around the opposition between two birds, the mutum (*mytunangwera*) and the gavião (*kwandua taravea*). From this opposition,

a series of connections and dialogues with other ethnographies and with anthropological theory emerge, mainly the one that deals with the theme of dualism and the perpetual imbalance of the Amazonian systems (LÉVI-STRAUSS, 2008).

These indigenous groups are distributed in the middle Madeira River, state of Amazonas, in the upper Madeira River and Machado River in Rondônia. The Kagwahiva are divided, for a better understanding of their geographical distribution, in the Madeira river basin, into northern and southern. The northern Kagwahiva are constituted by the Tenharim, Parintintin and Jiahui. The southern Kagwahiva are formed by the Amondawa, Jupaú and Karipuna.

The Tenharim live in three different indigenous territories, the Tenharim from the Preto creek, the Sepoti River and the Tenharim of the Marmelos River or of the Trans-Amazonian Highway (PEGGION, 2006), a group that participated in this study.

The approach used in this study was qualitative because the data were obtained through semi-structured interviews, following free dialogues in obtaining descriptive data from the reports of the target audience (VIERTLER, 2002). The rationale for approaching this work, with the qualitative methodology, encompasses a socio-affective construction of knowledge since such knowledge is part of the subjects' history and reality.

According to Minayo and Sanches (1993), the object of the qualitative approach is the level of perceptions and feelings, in constant interaction with ecological elements, meanings, motives, aspirations, attitudes, beliefs, and values, which are expressed through a common language and in everyday life, seeking to delve deeper into the complexity of phenomena.

2 METHODOLOGY

2.1 Location of the indigenous territory covered in this study

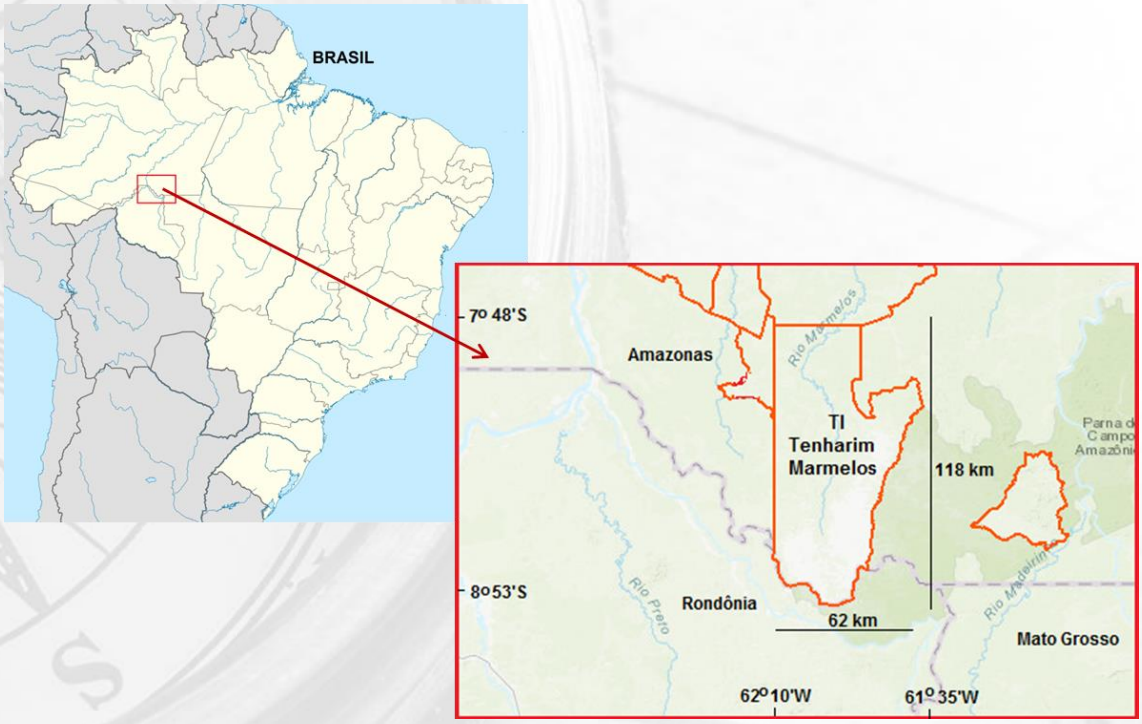
The indigenous territory contemplated in this study is that of the Marmelos River group (*Yytyngy'hu*), formed by ten villages. In the past, before the opening of the Trans-Amazonian Highway (BR-230), they lived together in a single village on the banks of the Marmelos River, in the area where the Trans-Amazonian Highway currently crosses the river (PEGGION, 2006). Following the very social dynamics of fusion and fission of groups, there was a process of emergence of new villages. All of them were built where there were ancient villages. The legal situation of this indigenous land is consolidated, since its

regularization process was completed with its homologation on January 05, 1996 (ISA, 2018).

The Tenharim Marmelos Indigenous Land has an official area of 497,521 hectares and is located entirely in the State of Amazonas, in the municipalities of Humaitá and Manicoré, between geographic coordinates 7º48' and 8º53' south latitude and 61º35' and 62º10' west longitude (Figure 01).

According to the sensing carried out in this study, through information collected in the villages, the Tenharim Marmelos Indigenous Land counted, in October 2014, had 710 indigenous people, distributed in eight villages located on the banks of the Trans-Amazonian Highway: Vila Nova, Marmelos, Bela Vista, Trakuá, Kampinhu, Taboka, Mafuí and Kastanheira and two villages located on the Estanho Highway: Jakuí and Karanaí.

Figure 01 – Location of the Tenharim Marmelos Indigenous Land.



Source: ISA - Instituto Socioambiental (2018).

2.2 Characterization of the landscape in the study region

The Tenharim Marmelos Indigenous Land is inserted in the Amazon biome, with the following vegetation formations: Open Ombrophilous Forest with vines in the northwest portion; Dense Ombrophilous Lowland Forest with emergent canopy associated with

Submontane Open Ombrophilous Forest with palm trees in the north and midwest portions; Submontane Dense Ombrophilous Forest with emergent canopy in the northeast portion; Contact Savannah with Ombrophilous Forest associated with the Open Ombrophilous Lowland Forest with palm trees and Forested Savannah in the central and south-central portions following the Marmelos River from its headwaters to the vicinity of the Trans-Amazonian Highway; Savannah Park with gallery forest associated with the Wooded Savannah with gallery forest in the southern and central-eastern portions (IBGE, 2012).

The Dense Ombrophilous Forest is characterized by phanerophytes, in addition to vines and epiphytes in abundance. Its main ecological feature resides in the rainforest environments that greatly mark the “floristic forest region”, with large trees, often over 50 meters in height, which stand out in the uniform arboreal stratum, between 25 and 35 meters in height. The Open Ombrophilous Forest has a forest physiognomy composed of more widely spaced trees, with a low-density shrub layer and frequent groups of palm trees, such as babassu (*Attalea speciosa*) in the interfluves and buriti (*Mauritia flexuosa*) in the valleys (IBGE, 2012).

The Forested Savannah has a predominance of woody vegetation, with a maximum height of 20 meters, and crooked trunks with irregular branches. The Wooded Savannah is characterized by a sparse shrubby physiognomy and continuous herbaceous layer, with a floristic composition similar to the Forested Savannah, but with dominances that characterize the environments. The Savannah Park consists of a herbaceous layer with isolated trees up to 5 meters high (VELOSO, 1992).

2.3 Use and occupation of indigenous territory

The modes of use and occupation of the indigenous land by Tenharim cover various aspects of the group's modes of social organization and are expressed through knowledge of the indigenous area based on its social, economic, political, and socio-cosmological classification. This classification ends up permeating the various spaces that make up what is now known as the Tenharim Marmelos Indigenous Land.

The Tenharim distinguish different physical spaces in the landscape, and each of these units allows the manifestation of different techniques for the use and management of natural resources. The main unit, as it is the most representative of the landscape and source of much of the resources, knowledge, and traditions of the Tenharim, is the forest or forest, known in the Tupi-Kagwahiva language as *ka'gwyra*. According to Silva (2006, p.48),

"the forest is the main provider of the Tenharim life, with the imaginary intrinsically linked to the animals, trees, and entities that inhabit it".

Other subdivisions fit into the view of the Tenharim over the forest, determined not only by physiognomic aspects of the vegetation, such as natural fields or forests but also by cultural aspects, which end up implying different uses or handling. In this line, *ka'gwyrahuhava* is part of the forest where a lot of time is spent (BETTS, 2012), located close to each village, where hunting, fishing, fruit, and medicinal plant gathering activities are practiced. Generally speaking, it is the part of the forest inhabited and used by the Tenharim.

Ka'gwyrahuhava is crisscrossed by numerous paths and trails that lead to the main points of interest of Tenharim, such as places with fruit trees, mud pits, chestnut groves, old villages, and gardens, cemeteries and especially to the Marmelos river, which provides the reference base for the construction of a spatiality within the Tenharim Marmelos Indigenous Land.

In contrast, there is the virgin forest or large forest, known as *ka'gwyrauhu*, which is beyond the daily use of the Tenharim, since "contact" happens "only during festivals", notably in *Mboatawa*, when hunters look for places rich in fauna, as a way to look for food to be used in the party (PEGGION, 2006). *Ka'gwyrauhu* is considered "the management plan": "It's virgin forest there. We only go there to get our food. It's for nature to reproduce there" (R. Tenharim, 55 years old, ♂, Vila Nova village).

Some forests are under the influence of river floods, known in the Amazon as Igapó Forest. These are partially flooded in the rainy season (*ypopeva*). The igapó is very frequented during the flood season for fishing activities, as many fish enter these flooded forests in search of food.

With physiognomic characteristics completely different from the forest, there are natural fields of savannah called *nhuhũ*, which, in addition to being easily differentiated in the landscape, provide the practice of other activities and knowledge.

The clearing of the forest also makes possible other uses of the land, but, mainly, the institutionalization and organization of social life. In this logic is the grouping of family nuclei in different villages, each with its dwellings, fields, and extensions that penetrate the forest, such as the chestnut groves.

The swiddens, called *koho*, are the ideal places for the cultivation of different plant species, mainly edible ones. The dwellings, on the other hand, are composed of houses, called *onga*, and the open and clean space around it, called *okara* (yard), where medicinal

herbs and trees are planted, mainly fruit trees and/or for shade and shelter for domesticated animals. However, it is not just the set of houses and yards that make up the village. Asked what the spatial limit of the village would be, one interviewee replied: “It is the black earth. The roça is part of the village. Mata is no longer part of the village, it belongs to everyone, they use it for hunting and fishing (*nhande ka'a gwyra*)” (J. Tenharim, 76 years old, ♂, Taboka village).

The old swiddens, which without maintenance were taken over by regenerating secondary vegetation, becoming capoeiras, indicate the ancestral use of the land by the ancients, being called *kohogwera*. Interesting to note that *gwera* is defined as something, state, or action that existed, but stopped, leaving only a trace of its form (BETTS, 2012). In the case of old swiddens, these vestiges are recognized through certain species of plants and animals that only occur in these places.

Therefore, the capoeiras are seen not as an initial stage of the regeneration of the natural forest, but as ancient gardens of the ancestors, established in places of terra preta with rich soil and conducive to cultivation, which can be resumed at any time in case of need. They also act as food deposits, both for tubers and fruit species, which continue to produce for many years (DIEGUES et al., 2000).

The Tenharim Marmelos Indigenous Land is located in a well-preserved region of the Amazon Rainforest, and the cultivation and extraction practices of the indigenous people have not caused damage to the natural environment.

2.4 Data collection

The studies in the Tenharim Marmelos Indigenous Land were carried out between the 2nd and 28th of October 2014 and the 23rd of November and 2nd of December 2015, after authorization by the Tenharim and FUNAI. People of different ages and genders from all villages were interviewed. The choice of the interviewees took place with their indication in the villages based on knowledge about medicinal plants.

47 indigenous people were interviewed, through individual dialogues and in groups (workshops), usually on walks through the forest, with the indication of the plants, the part used, details on the preparation of the medicine and its uses in the Tenharim medicine, with testimonials of its efficiency proven in the treatment and cure of indigenous patients. Plant materials such as leaves, flowers, and fruits were photographed for later identification through comparison in herbariums.

The ages of respondents vary, with the youngest being 14 years old and the oldest 95. Just under 50% of respondents are over 50 years old, 41% are aged between 30 and 50 years, old and only 10% are under 30 years old. It was observed that some children and teenagers who followed the walks through the woods, listened attentively to the information that the adults were passing on about the uses of plants and some knew the names of plants and their uses, which shows their interest in the subject and which information is transferred.

At the end of each interview, the interviewee was asked to indicate the names of people they thought they knew about the subject related to medicinal plants, to build the social network and carry out the next interviews. This sampling technique, known as “Snowball” is used in the creation of social networks, where it is possible to observe the levels of communication and interaction between people (BERNARD, 2002).

The information collected in the interviews is presented in this text in italics, followed by the informant's data, in a generic way, for example, (D. Tenharim, 28 years old, ♀, Mafuí village), to avoid any kind of embarrassment. A textual transcription (without alterations) of the interviews and the translations of the testimonies given by some elders in the Tenharim language was carried out.

Some names of the plants in the Tenharim language were kindly spelled by interviewees during the research and checked in the Kagwahiva Dictionary (BETTS, 2012). Confirmation of the spelling of the scientific names was obtained by consulting the plant species index on the Flora Brasiliensis project website (2021).

The botanical classification system adopted was the APG IV (2016). It is a modern taxonomic classification system for flowering plants (angiosperms), essentially based on molecular phylogeny studies, developed by the Angiosperm Phylogeny Group, resulting in a total of 64 orders and 416 families of angiosperms (SOUZA; LORENZI, 2019).

A direct link between plant species used as medicine and their medicinal treatment has not been established, to protect traditional indigenous knowledge, according to Law 13,123, of May 20, 2015, which provides for access to genetic heritage, protection, and access to associated traditional knowledge and benefit sharing for conservation and sustainable use of biodiversity.

2.5 Botanical classification system for the Tenharim

Note the existence of a plant classification system based on the therapeutic qualities attributed to the plants, the parts used, the life forms of the species and the conditions in which each species or part of it is found.

These associated characteristics serve to taxonomically classify a given species. Thus, the same taxon may have more than one name, depending on the part used or the purpose of use. Thus, we sought to investigate such classification variations, as shown in Table 1.

For example, among the Tenharim, the chestnut tree (*Bertholletia excelsa*) has several names defined according to the criteria adopted, which can be a certain part of the plant combined with the function or condition in which it is presented. Thus, among the names given to the chestnut tree, the following stand out: *nhahã iva* for the chestnut tree, *nhayva* or *ñayba* for the chestnut only, *kataña* for the chestnut hedgehog, *yvotira* or *yvytyra* for the chestnut flower that has fallen and is on the ground, indicating that the tree will soon bear fruit, *ipotyra* for the blossom of the chestnut still on the tree, indicating that there will be annual chestnut production, *nhadyva*, to name someone's chestnut grove and *iravagwete tuvi juvy* as a generic place where clustered chestnut trees occur.

Another example of a Tenharim classification that deserves to be highlighted occurs between four species with no apparent taxonomic relationship since they are taxa belonging to four distinct families. The understory palm *Astrocaryum gynacanthum* was determined as a *tukumaʹĩa* by several interviewees, when the subject was related to the small fruits appreciated by both the indigenous people and the fauna, being a clear reference to the *tukuma* (*Astrocaryum aculeatum*) but with smaller fruits, determined by the presence of the suffix i, used as a diminutive (BETTS, 2012). However, the same species was referred to as *ka'a* (leaf) or *ka'a pukuhu* when the subject was related to the leaf used to make *pokeka*, which is a type of package made from leaves in which fish and mushrooms are wrapped for roasting. The *pokeka* is usually tied with a vine that the Tenharim call *y'po* or *ipopohu*, which is the root of a hemi-epiphyte species of the genus *Philodendron*.

Along the same lines, the herbaceous plant *Ctenanthe ericae* receives similar names such as *ka'a*, *ka'a poku* or *ka'a pukuhu*, as it is used for the same purpose: *pokeka*. However, this does not seem to be a rule, since the vine of the genus *Abuta* is also called *ka'a*, although its leaves are used to clean the face and not to make *pokeka*. Adding to the complexity of the classification system, the leaves of another vine, *Machaerium caudatum*, which is also used to clean the face, were given a completely different name, *koetinha* or *koetinga*, despite having the same function.

Table 01 - Terms used in the botanical classification of the Tenharim

Classification			Tenharim Name	Betts (2012)
Habit	Tree	Thick Tree	*Yva*	-
		Small Tree	*Yvai*	-
		Tree	*Gwyra*	-
		Stick	*Iyva*	*-'yva*
	Palm Tree		*Pindoeter*	*Pindokupypeva*
	Vine		*Y'pó*	*Yvaty'ryra*
	Herb		*Nhungwavihua*	*Nhungwava*
	Fungus		*Yvepó*	*Yvepoa*
Part of the plant	Flower		*Ibótyra, Yvotyra, Ipotyra*	*Yvotyra, Yvaty'ria*
	Fruit		*Ihá, Yvaia, Ywai*	*Yva'ia*
	Seed		*A'ynha*	*A'ynha*
	Leaf		*Ka'a*	*Ka'a / Ohova*
	Trunk/Wood		*Iyva, Yva*	*-'yva*
	Root		*Yvapó, Apó, Embó*	*Yvapoa, -apoa*
	Branch		*Akã, Ãkã*	*Akã*
	Bark		*Japé*	*Ypea, Jypea, Yvaypea, Yvypea*
	Branch Sprout		*Uhã*	-

Source: Fieldwork.

3 RESULTS AND DISCUSSION

Human beings take from their environment what they need and, in the case of collection, assume that they have knowledge and mastery of the species. Mastery of the environment is only possible thanks to the culture that designates the *savoir-faire* set of practices, knowledge, attitudes, and ideas that each individual receives, internalizes, modifies, or elaborates during their existence (CLAVAL, 1997).

Traditional knowledge can contribute to maintaining the biodiversity of ecosystems. In numerous situations, this knowledge is the "result of a co-evolution between societies and their natural environments, which allows the conservation of a balance between both" (LÉVÊQUE, 1997, p.55).

The relationships established between indigenous peoples and the environment in which they live are very important for their survival and the preservation of this environment. Such relationships are complex, evidencing a mythical interaction between human beings and the elements of nature. In this way, changes in vegetation cover or water resources can imply a profound change in the relationship between indigenous peoples and the

environment.

Knowledge of the properties of plants for use as medicine and the complex relationships that exist between the indigenous people and nature are not passed on or learned in a systematic and formal way among the Tenharim. Apparently, there has to be some interest in acquiring such knowledge and most of the interviewees said they had learned about the "bush remedies" from their parents and grandparents: "Before he died, my grandfather passed on the information to me" (I. Tenharim, 45 years old, ♂, Karanaí village).

> "*The knowledge came from our ancestors [...] There are people who have to study a lot with their relatives, to research and learn, to get to know the plants. Our children, not all of them know. That's why you have to hang out with the old people, the traditional ones, to find out what fruit it is, what clan it is from, what it's for [...]. Those who commit themselves have a greater chance of having more knowledge. Many things I learned from my grandfather, from my father. If you don't care, things will get lost... In twenty or thirty years, people will ask me and if I didn't care about my culture, I won't know how to answer [...]. Each plant has its own resistance organism in each place. And each place... There are places where it works more naturally, to develop and there are places where it doesn't [...]. Plants that are very rare have to be taken care of more because if you don't take care of them they become extinct [...]. When mothers don't care, children don't learn. They only learn when mothers teach. But we, we got together to talk to these mothers [...]. It is important today to study, but you also have to be together, with your own mind, listening and teaching about our origin, our customs and also knowing the customs of the white people" (M. Tenharim, 52 years old, ♀, Mafuí village).*

Most of the Tenharim have a broad view of the environment in which they live, they know dozens of plants and the benefits they can offer them, whether through bark, leaves, roots, or sap to cure diseases, fruits for their food, or for the different species of wild animals, trunks for building houses and various utensils, straw for roofing houses and fibers for building parts for different purposes.

On a walk through the woods near the Marmelos River, J. Tenharim (40 years old, ♂, Jakuí village), identified the footprints of several species of animals and told stories about their relationship with the environment in which they live and among a multitude of information, told us that the fruit of the smooth uchi (*Endopleura uchi*) "is the favorite of all Amazonian animals", with the fruit of the pama (*Helicostylis scabra*) being the second in preference. Other plants, despite having no direct use for the Tenharim, such as the tachi (*Sclerolobium* sp.), are recognized and denominated as a form of protection, since these trees establish associations with other animals, in the case of the tachi, with the aggressive

ants of the genus *Pseudomyrmex*, demonstrating that Tenharim have enormous knowledge of the forest and its ecological relationships.

The existence of every being has meaning for Tenharim. Army ants, which are carnivorous and known for organizing themselves in periodic expeditions of thousands of individuals, were recorded on one of the walks through the forest and it was explained that:

> *"When you get screwed by these ants, you can't scream no [...]. Tandavuhua, who is their boss, is laughing. He's like people. It is hidden in the hollow of the stick. Only the pajé can see it. My grandfather's father told to my father who told to me. The Tandavuhua is not the boss of all ants, it's just this one. His right arm is short and his left is long. His arm is like a saw." (J.C. Tenharim, 33 years old, ♂, Taboka village).*

One of the Tenharim leaders (C. Tenharim, 74 years old, ♂, Marmelos village), possessing an incredible knowledge of the relationships between plants and animals, presented songs of various animals and their respective stories, rich in fantasy and poetic touches, emphasizing many times the diversity of the mysterious forest. According to some interviewees, the plants that the Tenharim know and use were the birds that indicated:

> *"The tangara pyainhi [a species of bird] has a strong pajé [shaman]. And if he has a disease, he will seek the cure. He lives at the head of the Marmelos, and is black with blue stripes. He is the one who tells where the medicine is and points with his beak where the medicine is. It was he who recommended tymoatã [Senna sp]. Each bird indicated a type of food. The juriti [Leptotila sp] gathered the birds that taught the Tenharim what to eat. The macaw indicated the flour" (J. Tenharim, 76 years old, ♂, Taboka village).*

The transfer of knowledge was also a theme investigated in this study. Many children and adolescents know the names of the main plant and animal species and their biotic interrelationships, but the mythical interrelationships are preserved only among the elderly. Ethnobotanical knowledge is also present in the daily life of the children who live in these villages, who know most of the plants used as medicine and in food.

From the information collected in the interviews, workshops, and field surveys, in which most of the indicated plants were presented *in situ*, it was possible to list just over 300 species of plants for various purposes, including the different forms of life (trees, shrubs, subshrubs, herbs, vines, epiphytes, palms, parasites, and hemiepiphytes). The great diversity of recorded species demonstrated that the use of plants by Tenharim is very comprehensive and that the use of different species for the same purpose is not related to their taxonomic proximity.

What could the gaze of a Tenharim, accustomed to its world, perceive in it when observing it? Many of the interviewees mentioned the richness of the environment in which they live and concerns that these environments are increasingly impacted:

> *"We are very rich. We have the virgin forest, we have the fruits [...]. When I see that she's being harmed, it's like a piece of my heart is ripped out [...]. I want it to stay like this, green, the way it is there. I want to breathe, consume her [...]. This land here is like a mother to us. We understand it that way because that's how our ancestors passed it on to us. She messes with our lives. It affects our lives because it's where we breathe because it's where we live" (M. Tenharim, 52 years old, ♀, Mafuí village).*

According to some interviewees, when the forest is cut down, the entities that protect the forest leaves. Therefore, it is evident that impacts on the vegetation cover severely alter not only the Tenharim way of life, but also deeper aspects, such as the cosmology, and the loss of this cosmology, transmitted between generations, can produce irreversible damage to the Tenharim culture.

Tenharim cosmology integrates living and non-living, human and supernatural elements, representing different domains, such as the Sky, the Forest, the Water, and the Underground. Several of the activities carried out by the Tenharim "are marked by rituals that denote another type of relationship with the world and another type of cosmology" (PEGGION, 2006, p. 163).

The interviewees showed great knowledge and respect for the environment in which they live and it was possible to learn a little about the diversity of fauna and flora, the relationship between animals and plants, and the richness of the entities of the forest. The Tenharim have a perception of the social organization of forest beings that categorizes them into groups and leaders, in addition to also belonging to the Mutum and Gavião clans, each group of animals has its own leader:

> *"The entities protect the forest. Only the pajé saw it, but there are no more pajés in the villages [...]. Mbaira likes to pinch people's ears when they're little kids. All these risks that we have in our hands are Mbaira who risked them. Mbaira is on the rock [...]. The forest has its leader, Pai da Mata. Each animal has its boss. Pig has his boss. Queixada has his boss. Do you know the name of the chief of the peccary? Amoim. He stays away. Queixada is here, but he is far away. Before you get close to the peccary, Amoim is already feeling down. Amoim has many pajés, he is very powerful. He's tiny, he doesn't have fur, he's naked [...]. Plants also have a leader, it is the Mãe da Mata [Mother of the Forest] [...]. What's here is... I've never seen it, but there's one here in the woods: Curupira, who is like a person, except that his foot is backward. There's Kwatazin, who is Mãe da Mata too. He likes to walk*

> *in the igarapé. We've already seen traces of him. He walks with the bow and arrow. His trail is just like that of a child. There are some of them that are angry, they want to shoot people. Sometimes they go in pairs. There are male and female [...]. The Mãe da Mata beats sapopemba. She hits with a stick and the sound goes far. She doesn't like to be hunted, but getting medicine is no problem [...]. There is also another one, Anhaĝa'avukuhua, who is the Mãe da Mata and has long hair. In that long hair, there are all kinds of insects, snakes, lice, cockroaches, scorpions, and lizards. He's evil. He walks during the day. It's hard to see. Only the pajé who sees [...]. There is Tandavuhua, who is also evil, who wants to burn his hair, from Anhaĝa'avukuhua. There's Pejogwauhua. There is Manti, who is a curupirinha, he whistles for people. He's evil. He says he's just like us too [...]. There's Barrero's mother too. She stays in the clay pit and people think she's the tapir, but she's not. She is the tapir's mother" (M. Tenharim, 37 years old, ♂, Mafuí village).*

During the study, points were marked indicating the locations of villages in the indigenous land, as well as the main areas of use of natural resources. It was found that the greatest use is in the vicinity of these villages, however, some chestnut groves are located a few days away by boat on the Marmelos River, which suggests that the Tenharim use almost all of the demarcated territory, with a large part in the conservation of natural resources, which translates into a better quality of life for the indigenous people, within a cyclical system of need, availability, management, and conservation, aimed at maintaining the local biodiversity (GADGIL, 1993).

To designate "medicine" the Tenharim use the term *moanga* or *mohã*, according to information obtained in the interviews. However, Betts (2012, p.174) states that *mohaĝa* is the general term used for "medicine".

It was observed that the diversity of plant species recognized by the Tenharim, notably those for medicinal use, is quite large, and this statement was recognized in the discourse of the informants themselves. Confirming the enormous diversity of remedies used, 104 plant species used in prophylactic and curative medicine by these indigenous people were registered. Among the ailments treated with plants with medicinal properties, the flu, fevers, headaches, diarrhea, stomach aches, kidney problems, infections in general, wounds, and malaria stand out.

As a counterpoint, there is the dramatic account of an indigenous man (A. Tenharim, 50 years old, ♂, Mafuí village), one of the interviewees about medicinal plants, whose 14-year-old daughter died of tuberculosis in 2013. Despite having enormous knowledge about the use of home remedies, this father took his daughter several times to the medical center in Humaitá and, according to him, the girl was never treated properly and was sent to Porto Velho only "when she had no more nothing to do".

Recent studies conducted in different ethnic groups and regions of the country (BÓIA et al., 2009; LEVINO; OLIVEIRA, 2007; GARNELO et al., 2005), reveal high incidences of tuberculosis, leaving no doubt about the health relevance of this disease among the indigenous peoples in Brazil. According to data from FUNASA (2003), tuberculosis is among the ten main known causes of death in indigenous communities. Despite this, there are no reports of medicinal plants used by the Tenharim to cure this disease.

The efficiency of some remedies is also known by non-indigenous people who live in the region, and, from time to time, they seek out indigenous people for an alternative treatment for illnesses. However, the sale of medicines to the “whites” is not a common practice in the community, according to the tenharim leaders, mainly due to the fear that this knowledge will be “stolen” by people not connected to Tenharim.

Among the Tenharim, it was observed that medicinal plants were commonly used for the treatment of the most common diseases, seeking complementary allopathic remedies. For Amorozo (1996, p.62), “the use of allopathic remedies by traditional populations does not destroy preexisting explanatory schemes, but adds new possibilities to them”. In this way, some diseases seem to be seen as being curable only by herbs from the bush or by community specialists, and others by allopathic remedies.

The oldest ones are, currently, the best references and the greatest holders of the traditional Tenharim knowledge. In this sense, the main interlocutors designated to deal with plants with medicinal properties, in addition to other subjects such as hunting and gardening, were, for this study, the oldest. A Tenharim figure with knowledge about medicinal plants and healing processes was the pajé or *pajywega*, who no longer exists among the Tenharim. In this way, one of the main sources of the traditional knowledge of the Tenharim disappeared and new illnesses, such as tuberculosis, acquired after contact with non-indigenous people, remained untreated. Why aren't there more pajés among the Tenharim?

> *“The pajé is very mean. My father's grandfather was the last pajé of the Tenharim. After him, there was no other pajé. His name was Ukareju. It is not by the person's will that he becomes a pajé, the pajé is as if he were appointed [...]. The pajé actually sees everything. Just like God. God, he knows everything, right? Because the pajé... the pajé was like the sorcerer. He was like that... half good, half evil. I don't really know how to explain this, I don't have much knowledge [...]. In fact, each village had one, two, three pajés. There was one who was two brothers... Here in Taboka there was a pajé, who was my father's grandfather. Ukareju was one of the pajés. He had it on my mother's side too, my mother's grandfather was also a pajé. On the other side, there was also... They got along well with each other. They were*

> *older, and then they passed it on to their children [...]. My father's grandfather didn't pass it on to my father because the pajé is usually like that, the pajé generates the person. He passes on his teachings even when the child is in the woman's womb. So, he is born with the teaching. He already comes with the power of a pajé [...]. As he grows up, he gets his power. So, the pajé generates another pajé [...]. The pajé's thinking is divided: good and evil. He pleases the person and at the same time, he displeases another, with whom he doesn't get along, right? [...] The pajé ended, because he pleases the person and at the same time he displeases another, with whom he doesn't get along, right? [...] The pajé ended, because he had no chance to resist, had no chance to resist. One went to live in a place, the other in a place and there was no way for one to resist the other [...]. The end of the strength of the pajé, besides him there was his spirit that gave him strength. In addition to the spirit, there were people who supported him [...].These people were dying, those who gave him strength and he weakened [...]. The pajé was very good for us, he made medicine, but he also did spells [...]. In the old days, the pajé called all the animals to sing and heal people" (J.C. Tenharim, 33 years old, ♂, Taboka village)."*

Religion also plays a central role in the Tenharim way of life, influencing the maintenance or abandonment of certain customs or traditional knowledge. Altogether, there are three evangelical churches in the Tenharim Marmelos Indigenous Land. The influence of religion coming from non-indigenous people results in changes that affect the daily life of the Tenharim, even the use of medicinal plants, as evidenced in the speech of one of the interviewees: "we do not use any plant against the evil eye, only the Bible itself" (J.C. Tenharim, 33 years old, ♂, Taboka village).

The moieties define the Kagwahiva person, being through them that they receive the names, the spouse and establish political alliances (PEGGION, 2006). The Kagwahiva universe, defined and classified into halves, originates from the myth presented by Menéndez (1989, p.187):

> *"Nharemboi-py, Bahira also made a paint, another painting. With this painting he painted things so that there would be no confusion. Jaboti, indajá, chestnut tree, tucunaré, collared peccary, parrot, genipap, black jaguar, all this is Curassow. Now macaw, deer, banana, heron, tapir, papaya, cashew, jaguar, harpy eagle, everything is Kwandu-taravé. Kawahiwa is one of the two, it is Mutum-nanguera and Kawandu-taravé, and they marry between them."*

During the studies, it became evident that the classification of plants in halves symbolizes permission or restriction to the use of a certain plant, mainly for food purposes. However, in the production of medicines through the use of medicinal plants, apparently the halves do not act in a permissive-restrictive way: "Remedies, most of which we use are for

everyone. The medicine that Mutum uses, Taravé also uses" (J.B. Tenharim, 56 years old, ♂, Mafuí village).

With regard to the Tenharim perception of the landscape and the form of land use and occupation, most of the plants used by the interviewees for medicinal use are found in their natural environment, that is, in places covered by native vegetation, such as forests. (*ka'gwyra*), savannahs or natural fields (*nhuhũ*), old capoeiras or swiddens (*kohogwera*), and flooded areas, such as the igapó forests formed in the rainy season and the banks of the igarapés, and these environments are located, as a rule, around the villages. In these places, collections of in situ vegetative material are carried out for specific purposes.

In the yard (*okara*) and in the fields (*koho*) medicinal herbs are commonly grown, both native and exotic species, some of which are widely used not only in the Amazon but also throughout the national territory, such as mint (*Mentha spicata*) and basil (*Ocimum gratissimum*).

In these spaces recognized and distinguished by the Tenharim, there is a great diversity of medicinal plants and home remedies used. Table 02 lists the main plant species used by the Tenharim as a medicine, their popular names, and the Tupi-Kagwahiva language, in addition to the habit and part of the plant used.

Table 02 - Main plant species used by the Tenharim as medicine, listed in alphabetical order by botanical family and scientific name. (*) exotic species or of unknown origin

Family/Species	Portuguese name	Tenharim name	Forms of life	Part used
Amaranthaceae				
Alternanthera brasiliana	Penicilina	-	Subshrub	Leaf
Anacardiaceae				
Anacardium spruceanum	Caju-açu	*Nhumitá*	Tree	Resin
Apocynaceae				
Aspidosperma carapanauba	Carapanaúba, Quina-quina	*Yvapopema*	Tree	Inner Bark, Trunk
Aspidosperma cf. *excelsum*	Acariquara	*Wakaruré*	Tree	Inner Bark
Aspidosperma sp	Peroba	*Biraygyva*	Tree	Bark
Couma guianensis	Sorvão	*Turua, Turuete, Jugwa, Iwyhyga,*	Tree	Latex

Family/Species	Portuguese name	Tenharim name	Forms of life	Part used
		Turuwa, Juvaywa		
Couma utilis	Sorva	*Juvay*	Tree	Latex
Himatanthus sucuuba	Sucuúba	*Sukuuba, Yravadigauhu*	Tree	Bark, Inner Bark, Latex
Araceae				
Dracontium sp	Batata-de-cobra	*Dowikugara*	Herb	Stalk, Rhizome
undetermined	-	-	Herb	Stalk
Philodendron sp	Cipó-imbé	*Ambé*	Vine	Sap
Arecaceae				
Attalea maripa	Inajá	*Indaja, Indaja iva*	Palm Tree	Inner Bark, Rachis
Attalea speciosa	Babaçu	*Indatau, Indatahu, Datauhu*	Palm Tree	Rachis
Euterpe precatoria	Açaí	-	Palm Tree	Fruit
Asteraceae				
Acmella oleracea (*)	Jambu	-	Herb	Leaf
Bidens pilosa (*)	Picão	-	Herb	Root
undetermined (*)	-	-	Herb	Leaf
Bignoniaceae				
Fridericia chica	Crajiru	-	Vine	Leaf
Fridericia sp	-	-	Vine	Bark
Handroanthus incanus	Ipê-amarelo	-	Tree	Bark, Inner Bark
undetermined	-	*Jaguapohanuh ua*	Vine	Leaf
Memora sp	-	*Nhambuy*	Vine	Root
Tabebuia sp	Ipê	-	Tree	Bark
Tanaecium sp	-	*Tupandi*	Vine	Root
Tynanthus panurensis	Cipó-cravo	-	Vine	Leaf
Bixaceae				
Bixa orellana	Urucum	-	Tree	Fruit, Seed
Caricaceae				
Carica papaya (*)	Mamoeiro	-	Tree	Fruit
Costaceae				
Chamaecostus lanceolatus	-	*Tukajara*	Herb	Stalk, Leaf
Costus scaber	-	*Tukajara*	Herb	Stalk
Costus spiralis	Cana-do-brejo	*Bokaja, Tukajara*	Herb	Stalk, Leaf
Crassulaceae				

Family/Species	Portuguese name	Tenharim name	Forms of life	Part used
Bryophyllum pinnatum (*)	Escama-de-pirarucu	-	Herb	Branch
Dilleniaceae				
Davilla cf. *cuspidulata*	Língua-de-onça	*Ivagu'í*	Vine	Leaf
Davilla nitida	Cipó-de-fogo	-	Vine	Leaf
Eriocaulaceae				
Paepalanthus chiquitensis	Chuveirinho	*Ivytyra japupehuvea*	Herb	Inflorescence
Fabaceae				
Andira cf. *micrantha*	Sucupira	-	Tree	Seed
Bauhinia sp	Escada-de-jabuti	*Tupangajupihara*	Vine	Inner Bark
Copaifera glycycarpa	Copaíba-cuiarana	-	Tree	Resin
Copaifera multijuga	Copaíba-angelim	-	Tree	Inner Bark, Resin
Copaifera reticulata	Copaíba-mari-mari	-	Tree	Resin
Dipteryx odorata	Cumaru	*Kumbaru*	Tree	Leaf, Seed
Hymenaea courbaril	Jatobá	*Jutayva, Jutapevi*	Tree	Inner Bark
Hymenaea sp	Jatobá-do-mato	*Takoenbuku*	Tree	Bark
Hymenolobium sp	Angelim-pedra	*Arapiwyva*	Tree	Resin
undetermined	Faveiro, Fava	*Arapariwuhu*	Tree	Fruit
undetermined	Fava-do-rio	-	Tree	undetermined
undetermined	Barbatimão	-	Tree	Bark, Inner Bark
undetermined (*)	Bejinho	-	Shrub	Bark
Machaerium caudatum	Juquiri	*Kovetĩ ĝa, Koetinha, Koetinga, Coventiĝa*	Vine	Leaf
Mimosa sp	Caquira	*Kakira*	Shrub	Leaf
Ormosia sp	Olho-de-cabra	*Yway Iwangi*	Tree	Seed
Parkia sp	-	-	Tree	Sap
Sclerolobium sp	Tachi	*Ywyeantim, Kaiabopoti*	Tree	Bark
Senna multijuga	Pau-cigarra, Caquira	*Tapehi, Tapevy, Topehya, Topeija*	Tree	Leaf

Family/Species	Portuguese name	Tenharim name	Forms of life	Part used
Senna sp	-	*Timoata, Tymboatã, Tymoatã, Timontã*	Shrub	Stalk, Root
Humiriaceae				
Duckesia verrucosa	Uchi-coroa	*Gogorana, Tapenha pégua, Tapunha Pygwa, Wichi kuru*	Tree	Bark, Inner Bark
Endopleura uchi	Uchi-liso	*Wichi, Manduuwa, Manuva*	Tree	Bark, Inner Bark
Hypericaceae				
Vismia sp	Lacre	-	Tree	Latex
undetermined				
undetermined	-	*Eijuruhaiva pohã gã*	unknown	undetermined
undetermined	-	*Jyowi*	unknown	Leaf
undetermined	-	*Ipopevuhu*	Vine	undetermined
undetermined	-	*Juruwahiwapoã*	Tree	Latex
undetermined	-	*Moangi*	unknown	Leaf
undetermined	-	*Moitiniĝa*	unknown	Leaf
undetermined	-	*Tarakwaptera*	Vine	Leaf, Branch
undetermined	-	*Trakua pytera*	Vine	Stalk
undetermined	-	*Ururupwangi*	unknown	undetermined
undetermined	Guaribinha	-	Vine	Stalk
undetermined	Macaco-velho	-	Vine	Stalk
Lamiaceae				
Hyptis sp	Hortelãzinha	*Gwyryrypwangi*	Herb	Leaf
Mentha arvense (*)	Vick	-	Herb	Leaf
Mentha spicata (*)	Hortelã	-	Herb	Leaf
Ocimum gratissimum (*)	Alfavaca	-	Subshrub	Leaf
Lauraceae				
Aniba rosaeodora	Pau-rosa	-	Tree	Resin
Lecythidaceae				
Bertholletia excelsa	Castanheira	*Nhayva, Nhahã'yva, Ñayba*	Tree	Inner Bark, Seed, Branch Sprout
undetermined	Castanhola	-	Tree	Bark, Leaf
Lecythis pisonis	Sapucaia	-	Tree	Bark

Family/Species	Portuguese name	Tenharim name	Forms of life	Part used
Lygodiaceae				
Lygodium venustum	Macaco-seco	-	Herb	Root
Marattiaceae				
Danaea cf. *media*	Macaco-seco	-	Herb	Root
Menispermaeceae				
Abuta sp	Bota	*Yrovuhu, Yrovyhu, Dyrobohy, Irawohu, Yroruhu, Yrouwu, Yrauhu, Wyrauhu, Wyrohu*	Vine	Stalk, Inner Bark, Leaf
Abuta sp	-	*Ka'a*	Tree	Leaf
Metaxyaceae				
Metaxya rostrata	Macaco-seco	*Anhãkwera mboitahau*	Herb	Root
Moraceae				
Brosimum sp	Amapá	*Bururehu*	Tree	Latex
Brosimum sp	-	*Inguaiva*	Tree	Latex
undetermined	Gasolina	*Bururé*	Tree	Bark
undetermined	-	*Muiratinga*	Tree	Latex
Naucleopsis ulei	Barbudo	*Ydywahauwae, Miratinga, Diwawé, Yndywaha, Jywavaé*	Tree	Latex
Myristicaceae				
Virola calophylla	Sangue-de-dragão	*Nhimbitaywa, Joroai wapuaña, Imamu hueté*	Tree	Resin
Virola cf. *multicostata*	Sangue-de-dragão	*Ajuwari apuranga*	Tree	Resin
Virola sp	Sangue-de-dragão	-	Tree	Resin
Phyllanthaceae				
Phyllanthus niruri	Quebra-pedra	-	Subshrub	Stalk, Leaf, Root, Branch
Piperaceae				
Piper sp	Anestesia	-	Shrub	Leaf
Plantaginaceae				

Family/Species	Portuguese name	Tenharim name	Forms of life	Part used
Scoparia dulcis	Vassourinha	-	Subshrub	Leaf
Poaceae				
Cymbopogon citratus (*)	Capim-santo	-	Herb	Leaf
Eleusine indica (*)	Capim-pé-de-galinha	-	Herb	Root
Polypodiaceae				
Phlebodium decumanum	Rabo-de-guariba	-	Epiphyte	Root
Rhamnaceae				
Ampelozizyphus amazonicus	Saracura, Saracura-muirá	*Nhangwãpohãg wagwyhua*	Vine	Root
Rubiaceae				
Capirona decorticans	Pau-mulato, Mulateiro	*Odykete ywaé*	Tree	Bark
Chomelia sp	Unha-de-gavião, Unha-de-gato	*Kwanduhu puampé*	Shrub	Leaf
Uncaria guianensis	Unha-de-gavião, Unha-de-gato	*Kwandua poñapé*	Vine	Leaf
Sapindaceae				
Allophylus cf. *latifolius*	Vick	*Gwararu pohãgi, Itakwapitera, Guararupwangwi*	Shrub	Leaf, Sap
Sapotaceae				
Micropholis guyanensis	Maparajuba	-	Tree	Latex
Solanaceae				
Physalis angulata (*)	Joá	*Kajuaru, Kanapu*	Herb	Seed
Verbenaceae				
Lantana camara	Milho-de-grilo	-	Shrub	Leaf
Lippia alba (*)	Erva-do-campo	-	Subshrub	Leaf, Branch

Source: Fieldwork.

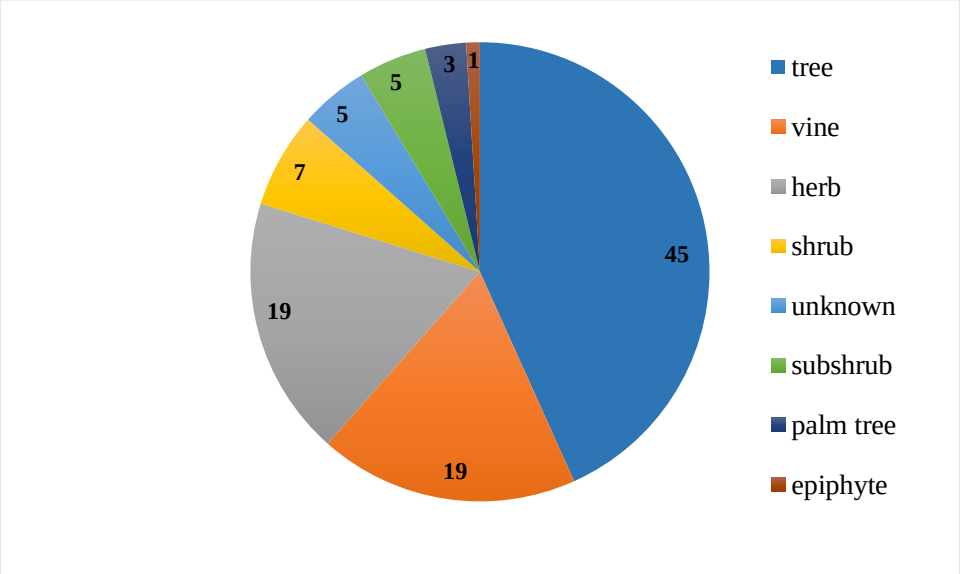
Of the 104 plant species registered with medicinal use, 59 were identified as species, 24 as genus, 10 as family, and 11 remain undetermined, that is, they were not identified taxonomically. The number of taxonomic indetermination can be explained by the impossibility of collecting and removing botanical material from indigenous lands, making the identification process of these species difficult, since this depends on consulting herbaria.

Figure 02 shows the quantification of the number of plant species with medicinal use identified in the different Tenharim villages according to their way of life. Tree species are the most used, with 45 taxa identified, followed by vines and herbs with 19 species each, shrubs with seven, subshrubs with five, palm trees with three, and epiphytes with one species. Five taxa that could not have their life form identified were also registered, as they were only reported by the interviewees.

Regarding the parts used of each plant, the bark and inner bark, the exudates (saps, resins, and latex), and the leaves are the most useful for popular medicinal treatment, probably because of the ease of collection and the practicality of using them extract its properties through infusion. Other plant parts used for the preparation of medicines are the trunks/branches/stems, roots, seeds, flowers, and fruit pulp.

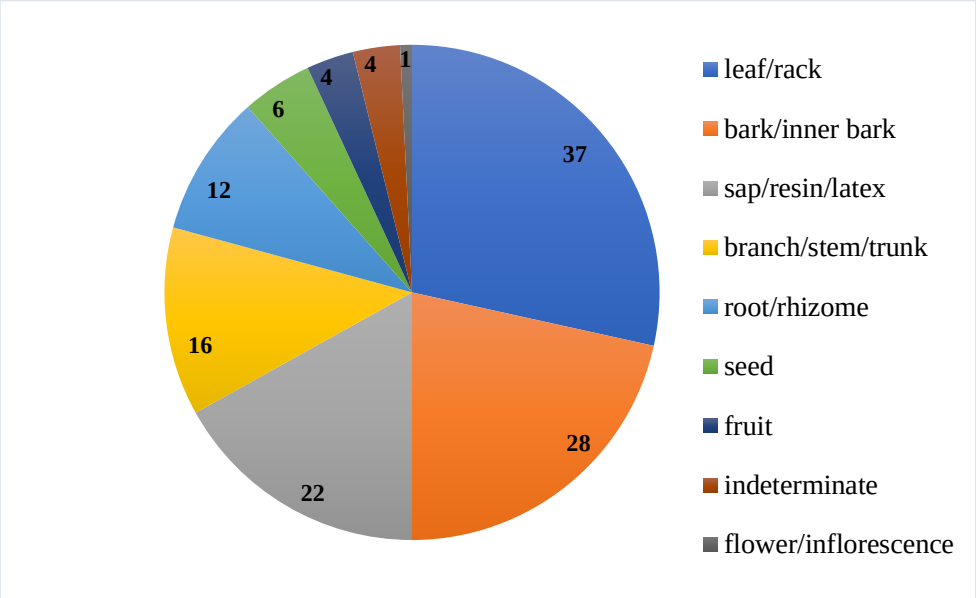
Figure 03 shows the quantification of parts of the plant indicated for the preparation of medicines that are most used by the Tenharim remedies; from parts of the leaves (leaf and rack) 37 different types of remedies are prepared, followed by inner bark and bark (n=28), exudates (sap, resin, latex) (n=22), woody parts (branch, stem, trunk) (n=16), root and rhizome (n=12), seed (n=6), fruit (n=4), flower and inflorescence (n=1). In addition to these, for four types of remedies, the parts used were not identified, since only their names were reported.

Figure 02 - Quantification of the number of plant species with medicinal use by Tenharim in the different forms of life.



Source: Fieldwork.

Figure 03 - Quantification of plant parts used to prepare the Tenharim medicines



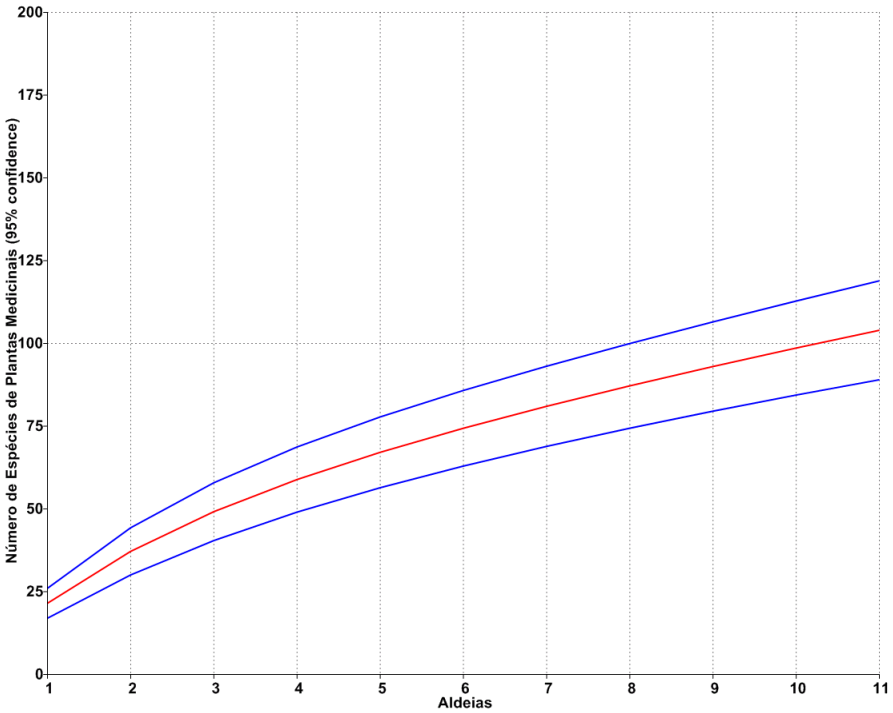
Source: Fieldwork.

The more or less intense use of medicinal plants in each of the ten Tenharim villages studied seems to be linked to different factors, such as the existence of people who have the knowledge of how to identify, find and use the plant that will make it possible to prepare a certain medicine, the importance given to tradition and the environmental specificities of each of the villages.

For villages that have both Ombrophilous Forest and Savannah vegetation, there was, probably due to the greater diversity of environments, a greater diversity of medicinal plants used.

An analysis of the sampling effort carried out in each one of the tenharim villages in this study, aiming to identify the diversity of medicinal plants, reveals only a tendency towards the stabilization of the species accumulation curve (Figure 04). This demonstrates the enormous knowledge about the Tenharim use of natural resources in medicinal practices, and that this is different in each of the villages, despite the geographic, political, and cultural proximity, not being linked only to environmental variations.

Figure 04 – Accumulation curve of plant species with medicinal properties identified in the Tenharim villages.



Source: Fieldwork.

Note: Numbers 1 to 11 refer to the ten villages and Estanho highway, considered as sampling points. The red line in the graph is the average of all possible accumulation curves of medicinal species, constructed from the randomization of the sequence of sampling points (ten villages and Estanho highway). The blue lines represent the 95% confidence interval.

5 FINAL CONSIDERATIONS

The relationships between the Tenharim and the environment in which they live are complex, evidencing a mythical interaction between these indigenous people and the elements of nature. The interaction between plant species and the Tenharim is evident and the sociocultural importance of the use and traditional knowledge of certain plants in the indigenous community studied, and the choice of some plants for specific treatments may be linked not only to their pharmacological action but mainly to function of a cultural meaning attributed to it.

There is a preoccupation of Tenharim with the preservation of their culture, which is being worked on within the community. The wide variety of plant species recorded in this study demonstrates that the use of plants by the Tenharim is comprehensive, with a very significant number of plant species used in prophylactic and curative medicine, vital for the cultural and ecological survival of these indigenous people.

Ethnobiological studies must be carried out and disseminated, for the conservation

and protection of the knowledge of traditional populations and the natural resources existing in their territories.

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