Ethnobotanical Knowledge on Non-conventional Food and Medicinal Plants in Rio Cajari Extractivist Reserve, Amazon, Brazil

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Abstract

Background:Information on the knowledge, management and ways of using food and medicinal plants by traditional populations, family farmers and Brazilian native population in the Amazon is essential to guarantee the sovereignty of these groups. The objective of this study was to evaluate the diversity, knowledge and ways of using non-conventional food and medicinal plants in traditional communities in a conservation unit in the Brazilian Amazon.

Methods:This study was conducted using semi-structured interviews applied to local respondents. Fifty-six residents were interviewed in 26 communities. The Indices of Use Value (UVI) and relative frequency of species citation (Fr) were evaluated; also, their diversity and equitability using the *Shannon- Wiener* (H') *Pielou* (J') indices, respectively. The species were listed according to their family, scientific name, popular names, categories of use, propagation environment, growth habit, medicinal indications, domestication status, production cycle and herbarium registration.

Results:A total of 269 species of both non-conventional food and medicinal plants were identified, distributed in 84 botanical families, 198 genera, in addition to 13 unidentified species. The Arecaceae and Lamiaceae families had the highest species richness (11 and 7, respectively). *Eryngium foetidum* L. (Apiaceae) and *Ipomoea potatoes* L. (Convolvulaceae) presented the highest relative citation frequencies (19.7 and 19.3, respectively) and the highest index of use value of the species (0.94 and 0.92, respectively). The *Shannon-Wiener* (H') and *Pielou* (J') diversity indices were considered high (5.02 and 0.9, respectively) when compared to other ethnobotanical works carried out in Brazil and in the Amazon.

Conclusions:A wide relationship of use was observed between the species under study and the population of this conservation area. In the environment in which these families are found, of geographical isolation and distance from urban centers, these species become, in many circumstances, the only food and medicinal resources, therefore, being fundamental to the sovereignty of these families.

Background

Brazil is a country of immense biodiversity, distributed throughout the biomes that occupy its territory. Among them, the Amazon stands out as the largest and the most preserved Brazilian biome, besides being the largest biodiversity reserve on the planet, occupying 49.29% of the national territory [1]. Its mega-biodiversity is currently estimated at around 2,500 tree species (representing one third of all tropical wood on the planet) and 30 thousand species of herbaceous plants and shrubs (out of a total of 100 thousand existing all over South America) [2]. This biome has a set of nature conservation units that are protected by law, such as the Extractive Reserves, where traditional populations, indigenous groups, *quilombolas*, riverside dwellers and family farmers live. These populations establish their forms of survival in line with and dependence on the available natural resources, especially non-conventional food plants and medicinal plants [3, 4].

It is a region of low demographic density, cut by countless rivers and lakes [5, 6], with an enormous coverage of tropical forest that, although has suffered an intense process of deforestation and forest degradation in the last decades, still preserves an extensive area of native forest [7]. This region is inhabited by populations in need of infrastructure and health and education services. The population has a low level of education besides being located in isolated places with difficult access and far from urban centers [8, 9], where people find in the forest resources, especially non-conventional and medicinal food plants, the main food and medicinal resources, respectively [10, 11].

Considering these specificities, these populations have developed a set of skills and tacit knowledge about the ways of using these forest resources over the years, adapting the survival strategies of the social groups living in these regions, whose knowledge has been tried, validated and transmitted through generations [12]. However, in the course of the last few years, due to an accelerated process of exploration of these areas, this knowledge has been lost [13], so it is necessary and urgent to carry out studies that investigate the potential of these plant species, which are associated with strategies for sovereignty, food security and therapeutically of these population groups [10, 14].

This study investigated the diversity, knowledge and ways of using non-conventional food plants and medicinal plants by traditional populations (collectors, family farmers, agro-collectors, *quilombolas*, indigenous and riverside inhabitants) in the Cajari River Extractive Reserve, state of Amapá, in the Brazilian Amazon. This conservation unit is located on the left bank of the Amazon River, an area cut by dozens of rivers and lakes, rich in plant biodiversity, fishing resources and wild animals that constitute the food base of the population residing in this conservation unit.

Methods

Study sites

The present study aimed to investigate the diversity, knowledge and ways of using non-conventional food plants and medicinal plants by traditional populations. Was carried out in a sustainable use conservation unit, the Rio Cajari Extractive Reserve (01°05′10″S e 51°46′36″W) (Fig. 1), which has an area of 532,397.20 hectares, and is located on the left bank and delta of the Amazon River, in the south of the State of Amapá. This unit is protected by law. It was created by Presidential Decree No. 99.145, of March 12, 1990 [15]. Its predominant vegetation is *terra firme* forests (the highest part of the unit), tidal flooded forests (intermediate part of the unit where floods occur and ebb from rivers) and flooded fields (next to the curves of rivers and streams, as well as rivers, streams and lakes.

The Cajari River Extractive Reserve covers the territory of three municipalities: Mazagão, Vitória do Jari and Laranjal do Jari, and has a population of 4,164 inhabitants [16]. It is located between the Maracá Agroextractive Settlement Project, at the BR 156 Highway (Macapá-Jari), the Jari Celulose Project and the Amazon River. Its population consists predominantly of family farmers who develop agroextractive activities (migratory farming of slash and burn agriculture, collection of fruits and vegetables in the forest and artisanal fishing); *quilombolas* whose inhabitants descended from slaves who came to the municipality of

Mazagão in the late 19th century; indigenous people of the Waiãpi ethnic group, riverside dwellers and extractivists who have the natural resources as their main source of survival.

The study was concentrated along three of the main rivers that make up the conservation unit, exactly where the communities where the collectors reside, in which the rivers Cajari, Muriacá and Amazonas (left bank) are located. In the Extractive Reserve there are communities, groups of several residences that are formed in strategic regions of the rivers, usually close to an inlet; in a place close to the mainland, favorable to small farms; with a vast abundance of certain products (Brazilian nuts, Acai), fishing resources; or even in strategic locations for navigation and local commerce, such as the mouth of rivers and *igarapes*.

The housed of the families can be seen in the communities. They are built of wood collected in the forest, covered with wood chips or asbestos tiles. The houses are built high above the level of the river and *igarapes* to avoid flooding during the Amazonian winter (rainy season from February to June). In most communities there is a level-I elementary school (up to the fifth grade), and in all communities there is the presence of religious institutions (Catholicism predominates, but with a marked presence of evangelical churches), elements of African and indigenous religions are also found there, showing strong religious syncretism.

Field trips and authorization for execution of the study

Four trips were made to the study area. Each trip lasted 12 to 15 days, from December 2016 to March 2017. These trips to the study area consisted of establishing an experience process with the community to conduct interviews and participate in their daily activities as well as the usage relationships with food and medicinal plants [17].

During the home visits, we sought to identify people recognized as owners of the ethnobotanical knowledge about medicinal and food plants [18]. To reach them, we counted with the help of key informants, such as agents of the unit's management body, leaders of local organizations, teachers of the unit's schools and some students from the Federal University of Amapá (UNIFAP) who are from RESEX Rio Cajari [19].

All the participants of this study were informed of its objective. They all agreed to participate and signed the Free and Informed Consent Form provided by the Ethics Committee in Research with Human Beings of the Federal University of Viçosa (CEP/ UFV), via Brazil Platform (Opinion number: 1.718.017).

Permissions for the study were obtained from the following agencies:

The research was registered in the National Genetic Heritage Management System (SisGen), which establishes criteria to access the genetic heritage and associated traditional knowledge, in accordance with the requirements of the biodiversity law (access registration number: A4DCD0D) [20].

The "Authorization for activities with a scientific purpose" was requested and obtained from the Biodiversity Authorization and Information System (SISBIO), an agency linked to the Ministry of the Environment (MMA), in order to obtain permission for the collection and transportation of biological material (authorization number: 55801-1).

The access to the conservation unit depended on authorization from the unit's managing body, the Chico Mendes Institute for Biodiversity Conservation (ICMBio), which issued the respective authorization, as well as the access to communities and their respective research informants were communicated and authorized by the organizations representing these residents, which were:

1. Association of Agroextractive Producers of the Middle and Low Cajari (ASS. CAJARI), in the Muriacá River region;
2. Association of Residents and Workers in Products of the Sociobiodiversity Chain of the Middle and Lower Cajari and Muriacá river active in RESEX Cajari (ACIOBIO), in the Cajari river region;
3. Association of Agroextractive Residents of the Cajari River (AMAEX-CA), in the Amazon River region.

Ethnobotanical data collection

Ethnobotanical information was collected through interviews with local experts who were appointed by the key-informants. In the interviews, semi-structured questionnaires containing pre-defined topics were applied, allowing the rise of new questions during the dialogue and the informants could spontaneously express their ideas about the use of plants for food and medicinal purposes [21].

Before starting the interviews, a pre-test of the interview script was carried out, with a group of five informants, in order to assess the clear understanding and precision of the terms, unfolding and order of questions, in addition to other information.

Plant species collection and identification

The collections of plant species were performed *in vivo*, with the participation of the informant, using the technique known as "guided tour" [22], in order to obtain the identification and more accurate information about the indicated species, following the methodological standards defined for ethnobotanical studies [23].

The species were registered by means of photographs and on records for the collection of botanical material.

Triplicates of each species were collected, then identified by means of comparison with samples from the Herbarium Collection of Amapá State (HAMAB), specialized bibliographies [24, 25] and consultation with botanical specialists. Subsequently, the exsiccates were herborized and incorporated into the collection of HAMAB, a faithful depository of samples of components of the Genetic Heritage of the Amazon, in the State of Amapá.

Data analysis

The homogeneity and diversity of food and medicinal species were assessed using the *Shannon-Wiener* Biological Diversity Index (H') and the *Pielou* Equitability Index (J') [26, 27]. These indices are used to assess the species richness in the studied area and the distribution of knowledge about plants among the research informants, respectively, were calculated for all food and medicinal plant species found in the present study, using the following equations:

Shannon-Wiener Biological Diversity Index (H'):

$$H' = -pi \sum log\ pi,$$

Where:

$Pi = n^i / N$

n^i = number of citations per species

N = total number of citations

Pielou Equitability Index (J'):

$J' = H' / H'_{max}$

Where:

H' = *Shannon-Wiener* Biological Diversity Index

H'_{max} = (natural base logarithm) of the total number of the species

These indexes were compared with the indexes of similar studies carried out in the Brazilian Amazon and also in other regions, inside and outside Brazil.

The daily demand of species for food and medicinal use was evaluated, using the Use Value Index (IVU) [28]. This index is used to assess how well the species are known and used by the local population [29]. The IVU was obtained using the following equation:

$IVU = \sum U / n$

Where:

U = Number of citations of the species

n = Total number of research informants

The Relative Citation Frequency (Fr) indicates how much particular species stands out in relation to the rest of the others, and expresses how well the species is known [26]. This index was obtained using the following equation:

$Fr = \sum (U \times 100) / N$

U = Number of citations of the species

N = Number of species found in the study

The species were classified as non-conventional food, medicinal and dual-purpose (food and medicinal) [30]. The propagation environment (vegetable garden, orchard, forest, family farm and riparian forest) and growth habit (creeping, climbing, herbaceous, shrub and tree) of the species were observed and categorized [31], in addition to the forms of use and therapeutic indications in the case of medicinal plants [32].

A classification was made regarding the domestication status of these species in order to verify whether they are cultivated, or whether they propagate spontaneously [31], as well as their production cycles in annual, semi-perennial or perennial.

To compare the ethnobotanical indexes of this study with those of the academic literature, other works were searched in the Scientific Electronic Library Online (http://www.scielo.org/php/index.php), Scopus (http://www.scopus.com/home.url) and Web of Science databases (https://clarivate.com/products/web-of-science/).

Results And Discussion

Social-cultural characteristics

The survey of non-conventional and medicinal food species was performed along the three main rivers (Muriacá, Cajari and Amazonas) of the Cajari River Extractive Reserve.

The information was obtained from 56 informants, residing in 26 communities along these three rivers, which totaled 2,896 citations of food and medicinal vegetable species, are shown in Table 1.

The Tapereira *quilombola* community stood out with the largest number of informants, as it has historically accumulated an inheritance in the use of plant resources based on the knowledge inherited from their African ancestors [30]. This community contributed to the eminence of Cajari river regarding the greater number of informants. The communities of Conceição do Muriacá and Foz do Ajuruxi are the most populous within the unit. Both are located in the inlets of the Muriacá and Cajari rivers, and Ajuruxi and Amazonas, respectively. They have a larger population contingent, serving as a market center for for products and people, with villages where schools, stores and health units are located, standing out among the other communities.

The number of informants per community is directly related to citations of plant species. The Tapereira community resulted in the highest number of species citations. However, the best citation average was generated in the Santana community as the informants in this community are familiar with a greater number of species of food and medicinal plants. The fact that the Tapereira and Santana communities had the highest number and average number of plant species has contributed to the fact that the Cajari River had the highest number of plant species mentioned (1215) and the average number of visited rivers (52.8 plant species / informant) (Table 1).

Table 1
Rivers, communities, respondents (resp.), citations on food and medicinal plants in the Cajari River Extractive Reserve, Amazon, Brazil.

River	Communities	Resp. / community	Resp. / river	Citations / community	Citations / river	Average of citations	
						Community	River
Muriacá 8 communities	Aterro do Muriacá	3	16	170	803	56,7	50,2
	Boa Vista	2		89		44,5	
	Comércio	1		44		44	
	Conceição do Muriacá	6		329		54,8	
	Mirituba	1		35		35	
	Santa Helena	1		42		42	
	São Luis	1		45		45	
	Vila Nova	1		49		49	
Cajari 9 communities	Costureira	1	23	39	1215	39	52,8
	Formigueiro	2		97		48,5	
	Paraíso	2		127		63,5	
	Poção	2		76		38	
	Santa Rita	3		144		48	
	São Sebastião	3		141		47	
	Tapereira	7		357		51	
	Terra Vermelha	1		66		66	
	Vila Santana	2		168		84	
Amazonas 9 communities	Foz do Rio Ajuruxi	4	17	268	878	67	51,6
	Rio Ariramba	1		38		38	
	Rio Arirambinha	2		76		38	
	Rio Bispo	1		53		53	
	Rio Capitão	2		136		68	
	Rio Carneiro	1		24		24	
	Rio Chato	1		58		58	
	Rio Mulato	2		96		48	
	Vila Betel	3		129		43	
		56	56	2896	2896		

The methodological procedure adopted in the present study resulted in the finding of 56 plant specialists (37 women and 19 men), aged between 25 and 97 years old (Table 2), and with the following social occupations: farmers, extractivists, artisans, builders, fishermen, chestnut collectors, rubber tappers, carpenters, shamans and midwives.

According to the informants, the ethnobotanical knowledge about PANC and medicinal plants is concentrated in adults. Of the 56 informants, 31 are people aged between 25 and 59 years old, whose average age is 58.9 ± 14.6. Although there are many elderly people, these results differ from other studies found in the literature in which they show that ethnobotanical knowledge about PANC and medicinal plants is concentraded in the elderly [31, 33, 34]. It is worth mentioning that the average age in the state of Amapá is 73.9 years [35], which is 20% higher than the average age of the informants in this study, thus, showing that this population, even though younger, has their ways of lives more dependent on the local plant resources.

The interviewees admitted that the young population of the unit are still interested in food and medicinal resources, although it differs from other studies on the subject [36], denominated Cultural Erosion by some authors [37]. However, it was possible to observe through the reports by the informants that in recent years, the phenomenon of urbanization in rural areas (access to traditionally urban goods and services, change in the income profile of some families), associated with the scarcity of some food resources (fish, and plants) has impacted the ways of life of local populations, gradually arousing greater interest in other food sources, and medicines in the pharmaceutical industry.

Table 2
Gender and age of the respondents and use category of the plants found in the Cajari River Extractivist Reserve in Amazônia, Brazil.

Respondents	Communities	Gender		Category of use			Average of age ± SD
		M	F	Med.	Food	Med./Food	
56	26	19 (34%)	37 (66%)	131 (48%)	72 (27%)	66 (25%)	58,9 ± 14,6

(M) = Male; (F) = Female; (Med.) = Medicinal; (DP) = Standard Deviation.

Regarding the gender of the survey respondents, there is a predominance of women (Table 2).They develop better knowledge about these plant species, as many of them are traditional cooks and some are midwives, who are responsible for preparing food and for the health of the family, while men are more explorers of the forest, involved in hunting and fishing, as observed in other works carried out with traditional communities [38, 39].

As for the category of use, ¼ of these species have a dual purpose (food and medicinal use). However, almost half of them are for medical use and the rest are for food use only, as observed in other studies conducted in Brazil [40], and in other countries in South America, Europe and Oceania [41, 42]. The relationship between the forms of use of these species occurs mainly because they are found in the same environment, propagated or cultivated using the same techniques. This relationship was established, above all, due to the geographic isolation in which these families are found, far from urban centers and without the possibility of income so to acquire other sources of food and medicines, therefore, these species have established themselves as the main resources, whose relationship is observed in other parts of Brazil and the world [43, 44].

Ethnobotanics data

A total of 269 plant species used for food and medicinal purposes were identified. They were distributed in 84 families and 198 botanical genera, resulting in a total of 2,896 citations. The species with the highest number of citations were *Eryngium foetidum* L. (Apiaceae) and *Ipomoea batatas* L. (Convolvulaceae), which were cited 53 and 52 times, respectively. *Eryngium foetidum* L. is a species of medicinal and food use. For therapeutic purposes, the tea boiled from its roots is indicated to fight parasites of the human organism, and as a food use, its leaves are cooked together with other foods. *Ipomoea batatas* L. is used for food purposes only, its tubers are cooked and served for breakfast (Table 3).

Table 3 contains information about the species identified in this study. The botanical families Arecaeae and Lamiaceae had the largest number of food and medicinal species, 19 and 17 species, respectively, with a predominance of species used for medicinal purposes. A situation also observed in other studies carried out with traditional populations in the Amazon, including studies carried out in rural communities in the municipality of Manacapuru, in Amazonas, Brazil [45]. In other communities in this municipality (Manacapuru/AM, Brazil), Costa, Mitja analyzed plant resources used by family farmers and observed a predominance of resources used for medicinal purposes [46].

In relation to the propagation environment of the species, it was found in the forest, vegetable gardens, orchards, Family farms and riparian forests (Table 3), but with predominance for those found in the forest (120 species) and in the vegetable gardens (65 species). This situation occurs mainly for two reasons. Firstly, because the study region is an environmental conservation unit in which plant extractions is the main source of income of the families, hence their strong relationship with the forest, as observed by Silva, Fantini, Shanley [47]. Secondly, because the communities where the families live are floodplain areas, which are flooded throughout the year, and like their residences, the gardens are also built with wood, or planted in canoes suspended from the ground, to prevent flooding and attack by animals that are raised loose, like buffalo. This form of cultivation in suspended beds has already been recorded in other studies with traditional populations and farmers in the Brazilian Amazon [45, 46].

It is observed a relationship between the propagation environment and the growth habit of these species, since among those found in the present study, 127 are of tree growth and 83 are herbaceous. The rest are distributed among those with shrub, climbing and creeping growth. Tree species propagate in upland forests, and herbaceous plants are grown in hanging gardens. Regarding the stage of domestication, the tree species are perennial native trees, found in the forest and riparian forests, and their food or medicinal resource are obtained spontaneously through collection. The other species are cultivated and grown in the suspended and cleared gardens, being species of annual and semi-perennial cycles. In the orchards are found the cultivated and spontaneous species.

Also, it is observed that the relationship between propagation environment, growth habit, stage of domestication and vegetative cycles is associated with the physiological characteristics of plants since there is no way to establish a tree species in a suspended garden, nor to cultivate a herbaceous in a shaded forest environment as observed in a study carried out on the use and knowledge of plants by traditional populations of the Tapajós National Forest (Santarém PA /

Brazil) [12]. The availability of these plant resources is associated with the social organization of families, since herbaceous species are required on a daily basis, and for this reason they are found in vegetable gardens and orchards, being easily accessible for women who deal with household activities [48]. The species located in the forest are seasonal, which makes them to be obtained, making them less required [48].

According to the informants' report, the number of PANC species and medicinal plants is decreasing and are found with more difficulties, mainly forest species with wood and food value, such as *Endopleura uchi* (Huber) Cuatrec, *Caryocar villosum* (Aubl.) Pers., *Bertholletia excelsa* H.B.K., *Tabebuia roseoalba* (Ridl.) Sandwith. This situation has occurred mainly due to the raise in the local population, which demanded the construction of more gardens and, consequently, increased the pressure on the river and the forest, but also due to the outbreaks of burning and deforestation that has frequently occurred within the unit. This is an aggravating factor, since many species are directly related to the food security of these families and there is no agronomic protocol, with propagation and management techniques that make it possible to replant seedlings.

The availability and seasonality of the species influence the social organization of families and communities [49]. This situation was observed in this study, since the forest provides many fruit food species, however they are only available during the Amazonian winter (February to June). After this period, the main food species are grown in the family farms (particularlry the rhizomes and some herbaceous) during the Amazonian summer (July to December). The gardens are perennial and have food and medicinal species throughout the year. Medicinal resources such as leaves, seeds and bark are also available year-round in forests, riparian forests and orchards.

It was found in this study 138 plant species for food use. Of these, 96 are fruit species (the others are vegetables, seeds and rhizomes), and correspond to 69.5% of the food species found in here. Vegetables are consumed with food and represent only 6% of this percentage, which corroborates the fact that fruits are more present in the diet of traditional populations in the Amazon, as already observed in other studies [12, 46], together with cassava flour (*Manihot esculenta* Crantz.) and fish [50, 51]. Also, the consumption of vegetables is low among this population group, as highlighted by Adams, Murrieta, Sanches [52].

Among the species found in the study and available in Table 3, it was observed that some of them, from the families Acanthaceae and Amaranthaceae, has the same popular name of the trade name of some medicines sold by the pharmaceutical industry, such as the anador species (*Justicia pectoralisvar. stenophylla* Leonard), *melhoral* (*Justicia pectoralis* Jacq.), Ampicillin (*Alternanthera tenella* Colla), penicillin (*Gomphrena arborescens* L.f.), terramycin (*Alternanthera brasiliana* (L.) Kuntze), cybalene (*Artemisia vulgaris* L.), paregoric elixir (*Ocimum selloi* Benth.), insulin (*Cissus sicyoides* L.), large vique (*Mentha spicata* L.) and small vique (*Mentha arvensis* L.). Other authors have already found similar to the one in which these home remedies are associated with names of industrialized medicines, usually prepared in the form of teas [53]. A possible explanation for the attribution of the name of industrialized remedies to many medicinal plants may be related to the influence of allopathic medicine in rural areas, in which the name given to these plants has something to do with the smell, taste or effect of an industrialized medicine [53, 54].

Table 3
Botanical family, scientific and popular name, category of use, propagation environment, growth habit, forms of use, medicinal indications, domestication st
vegetative cycle and registration of food and medicinal plant species found in the Cajari River Extractive Reserve, Amazon, Brazil.

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
Acanthaceae	*Justicia pectoralis* var. *stenophylla* Leonard	Anador	M	Vg	He	Leaf tea	Headache and stomachache	C	Sp	INP/ 206
	Justicia pectoralis Jacq.	Melhoral	M	Vg	He	Leaf tea	Headache	C	Sp	INP/ 106
	Justicia acuminatissima (Miq.) Bremek	Saratudo	M	Vg, O	He	Leaf tea	Tranquilizer, fever and measles	C, S	Sp	INP/ 223
Adoxaceae	*Sambucus australis* Cham. & Schltdl.	Sabugueiro	M	Vg, O	He	Leaf tea	Inflammation	C, S	Sp	INP/ 208
Amaranthaceae	*Alternanthera tenella* Colla	Ampicilina de planta	M	Vg	He	Leaf tea with *C. spicatus*, *P. niruri* and *A. muricata* leaves	Stomachache; urinary tract infection	C	Sp	INP/ 714
	Chenopodium ambrosioides L.	Mastruz	M	Vg, O	He	Leaf tea with *E. foetidum* and *C. papaya* roots	Worm	C, S	Sp	INP/ 277
	Gomphrena arborescens L.f.	Penicilina	M	Vg	He	Leaf tea with *C. spicatus*, *P. niruri* and *A. muricata* leaves	Urinary tract infection	C	Sp	INP/ 813
	Alternanthera brasiliana (L.) Kuntze	Terramicina	M	Vg	He	Leaf tea	Headache	C	Sp	INP/ 220
Anacardiaceae	*Anacardium occidentale* L.	Caju	Mf	O	Tr	M: Tree bark tea - F: fresh fruit	Diarrhea	S	P	CEN 652
	Anacardium giganteum L.	Caju açu	Mf	Fo	Tr	M: Tree bark tea - F: fresh fruit	Diarrhea	S	P	INP/ 612
	Curatella americana L.	Caju do mato	F	Fo	Tr	Fresh fruit		S	P	HAM 941
	Schinus terebinthifolia Raddi	Ceru	Mf	Fo	Tr	M: Tree bark tea - F: almond	Gastritis; worm	S	P	INP/ 139
	Mangifera indica L.	Manga	Mf	O	Tr	M: Tree bark tea; bath: leaves of *M. paradisíaca*, *E. oleracea*, *C. nucifera* and *C. citratus* / F: fresh fruit and juice	Stomachache; bathe woman after childbirth	S	P	INP/ 262
	Spondias mombin L.	Taperebá (cajá)	Mf	Fo	Tr	M: grind the tree knot and spread over the wound / F: fresh fruit and juice	Healing	S	P	INP/ 141
Annonaceae	*Annona glabra* L.	Araticum	F	Fo	Tr	Fresh fruit		S	P	INP/ 270
	Annona mucosa Jacq.	Biribá	Mf	Fo	Tr	M: put tree bark it in the water until it gets colored and drink it / F: fresh fruit and juice	Sore throat	C	P	INP/ 218
	Annona montana Macfad.	Conde	F	O	Tr	Fresh fruit		S	P	INP/ 246

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Annona muricata L.	Graviola	Mf	O	Tr	M: beverage of the leaves with *A. esperanzae* problem; leaf tea with *A. tenella* leaves, *P. niruri* and *C. spicatus* / F: fresh fruit and juice	Aches over the body; urinary tract infection	S	P	INP/755
Apiaceae	*Arracacia xanthorriza* Bancr.	Batata crioula	F	Ff	Cr	Cooked rhizome		C	A	BOT 250
	Eryngium foetidum L.	Chicória	Mf	Vg, O	He	M: tea of the roots with *C. papaya* leaves and of *C. ambrosioides* leaves / F: leaves cooked with other foods	Worm	C, S	Sp	INP/269
	Cuminum cyminum L.	Cominho	Mf	Vg	He	M: Leaf tea; grind the leaf with *C. frutescens* leaves and *P. nigrum* seed / F: leaves cooked with other foods	Morning seasickness; labor pain	C	Sp	MFS 006
Apocynaceae	*Parahancornia fasciculata* (Poir) Benoist.	Amapá amargo	M	Fo	Tr	Drinking tree milk	Ulcer and gastritis	S	P	INP/149
	Aspidosperma nitidum L.	Carapanauba	M	Fo	Tr	Beverage of the bark of the tree	Indisposition in the body	S	P	HAM 134
	Lacmellea arborescens (M. Arq.)	Guajaraí	F	Fo	Tr	Fresh fruit		S	P	INP/257
	Himatanthus drasticus (Mart.)	Sucuuba	M	Fo	Tr	Drinking tree milk	Indisposition in the body	S	P	INP/102
Araceae	*Montrichardia linifera* Schott.	Aningueira	M	Fo	Tr	Drink the sap from the stem	Swelling in the spleen (splenomegaly)	S	P	INP/144
	Caladium bicolor L.	Brasileirinho	M	Vg	He	Leaf tea	Hypertension	C	Sp	INP/126
	Heteropsis flexuosa (H.B.K.) G.S. Bunting	Cipó titica	M	Fo	Cl	Heat the plant stem and spread it over the spot	Stingray sting (*Brycon* sp.)	S	P	INP/408
	Pistia stratiotes L.	Mururé	M	Fo	Tr	Drinking tree milk	Inflammation	S	P	INP/108
	Philodendron martianum Engl.	Pacapeá	M	Fo	Tr	Pour the tree milk in the aching tooth	Toothache	S	P	IAN 232
	Xanthosoma taioba E.G. Gonç.	Tajoba	F	Ff, O	He	Leaf, stem and rhizome cooked together with other foods		C, S	Sp	EAF 110

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
Arecaceae	*Euterpe oleracea* Mart.	Açaí	Mf	O, Rf	Tr	M: tea with the roots, with *C. citratus* root, dry *C. nucifera* and *B. excelsa* exocarp, and *C. winterianus* leaves; bath with dry straw with *C. citratus*, *M. indica* peel and *M. paradisíaca* leaf; bath: dry leaves of *M. paradisíaca* and *C. nucifera* leaves, with *M. indica* peel and *C. citratus* / F: juice	Hepatitis; malaise during pregnancy; bathe woman after childbirth	C, S	P	INP/ 502
	Oenocarpus bacaba Mart.	Bacaba	Mf	Fo, O	Tr	M: tea with the roots / F: juice	Worm	S	P	INP/ 166
	Oenocarpus mapora Karsten	Bacabi	F	Fo	Tr	Juice		S	P	INP/ 237
	Manicaria saccifera Gaertn.	Buçu	Mf	Fo	Tr	M: drink *C. nucifera* water / F: fresh fruit	Gastritis	S	P	INP/ 169
	Mauritiella armata L.	Caranã	F	Rf	Tr	F: fresh fruit		S	P	INP/ 450
	Cocos nucifera L.	Coco	Mf	O	Tr	M: tea with the dry exocarp, with *C. citratus* root and *B. excelsa* exocarp, and *C. winterianus* leaves; bath (dry exocarp), *C. citratus*, *M. indica* peel, *M. paradisíaca* leaf and *E. oleracea* leaves; bath: dry leaves from *M. paradisíaca*, *E. oleracea* and *C. citratus*, with *M. indica* peel / F: fresh fruit and candy	Hepatitis; malaise during pregnancy; bathe woman after childbirth	C	P	INP/ 224
	Syagrus romanzoffiana (Cham.) Glassman	Coquinho	M	Fo	Tr	Drink the fruit water	Malaria	S	P	UB 433
	Elaeis guineensis Jacq.	Dendê	M	Fo	Tr	Beverage of root with *C. langsdorfii* oil and honey	Gastritis	S	P	IAN 442
	Maximiliana maripa L.	Inajá	F	Fo	Tr	Fresh fruit		S	P	INP/ 142
	Bactris acanthocarpa Mart.	Marajá	F	Fo	Sh	Fresh fruit		S	P	INP/ 163
	Mauritia flexuosa L.f.	Miriti	F	Rf	Tr	Fresh fruit		S	P	INP/ 170
	Acrocomia aculeata (Jacq.) Lodd. ex Mart.	Mucajá	Mf	Fo	Tr	M: tea with the roots / F: fresh fruit	Urinary tract infection	S	P	INP/ 187
	Astrocaryum murumuru Mart.	Muru muru	Mf	Fo	Tr	M: Pour almond oil over the aching tooth / F: fresh fruit	Toothache	S	P	INP/ 172

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Attalea phalerata Mart. ex Spreng.	Ouricuri	F	Fo	Tr	Fresh fruit		S	P	IAN 181
	Attalea speciosa Mart. ex Spreng	Palha preta (babaçu)	F	Rf	Tr	Fresh fruit		S	P	IAN 158
	Oenocarpus bataua Mart.	Patauá	F	Fo	Tr	Suco		S	P	INP/ 172
	Socratea exorrhiza (Mart.)	Paxiuba	M	Fo	Tr	Scrape the bark of the tree and put it under the navel	New-born navel healing	S	P	INP/ 704
	Bactris gasipaes (kunth)	Pupunha	Mf	O	Tr	M: massage the body with the fruit oil / F: boiled fruit	Aches over the body	C	P	INP/ 206
	Astrocaryum aculeatum G. Mey.	Tucumã	Mf	Rf	Tr	M: wash the hair with the seed water / F: fresh fruit	Loss of hair	S	P	INP/ 204
Aristolochiaceae	*Aristolochia esperanzae* Kuntze	Cipó pra tudo	M	Fo	Cl	Beverage with *A. muricata* leaves; leaf and stem tea with *C. sinensis* leaves	Pain (stomachache, headache); gases	S	P	INP/ 200
	Aristolochia cymbifera Mart. & Zucc.	Urubu-caá	M	Fo	Cl	Tea from the fruit and bark of the tree	Pain (stomachache, headache)	S	P	CEN 559
Asclepiadaceae	*Elcomarrhiza amylacea* Barb. Rod.	Cumacá	M	Fo	He	Pour plant milk over the eye	Sight problems	S	P	ESA 118
Asparagaceae	*Sansevieria trifasciata* Bojer	Babosa grande	M	Vg	He	Drink the beverage, or cut and spread the gel on the swelling; prepare mixture and massage the body; syrup with *K. brasiliensis* or *B. pinnatum* leaves and honey	Swelling, inflammation, low blood pressure; gastritis	C	Sp	INP/ 268
Asphodelaceae	*Aloe vera* (L.) Burn. f.	Babosa pequena	M	Vg	He	Drink the beverage, or cut and spread the gel on the swelling; prepare mixture and massage the body; syrup with *K. brasiliensis* or *B. pinnatum* leaves and honey	Swelling, inflammation, low blood pressure; gastritis	C	Sp	INP/ 106
Asteraceae	*Gymnanthemum amygdalinum* (Delie)	Boldo africano	M	Vg	He	Leaf tea, with *C. rotundus* and *F. chica* leaves	Malaria, diabetes and cirrhosis	C	Sp	IAN 192
	Matricaria recutita L.	Camomila	M	Vg	He	Leaf tea	Tranquilizer	C	Sp	UB 257
	Tanacetum vulgare L.	Catinga de mulata	M	Vg	He	Leaf tea. Leaf mixture with alcohol, leaves from *R. officinalis*, *R. graveolens* and *S. orientale* seed	Headache; diarrhea, stroke	C	Sp	EAF 117

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Artemisia vulgaris L.	Cibalena	M	Vg	He	Leaf tea	cramps, hemorrhage and fever	C	Sp	INP/ 195
	Mikania cordifolia (L.f.) Willd.	Cipó sucuriju	M	Fo	Sh	Beverage of the bark of the vine	Gastritis	S	P	INP/ 113
	Tagetes minuta L.	Cravo de planta	M	Vg	He	Leaf bath	Flu and cold	C	Sp	INP/ 208
	Clibadium surinamense Linn.	Cunambi	M	Ff	He	Seed tea	Pneumonia	C	A	INP/ 730
	Acmella oleracea (L.) R.K. Jansen	Jambu	Mf	Vg	He	M: beverage of the leaves with bee honey and *C. guianensis* oil / F: leaf cooked with other foods	Sore throat and flu	C	Sp	INP/ 234
	Eupatorium ayapana Vent.	Japana branca	M	Vg	He	Leaf tea	Headache	C	Sp	JPB 409
	Eupatorium triplinerve Vahl.	Japana roxa	M	Vg	He	Leaf tea	Headache	C	Sp	IAN 182
	Chaptalia nutans (L.) Pol.	Língua de vaca	M	O	He	Leaf tea	Hemorrhage	S	P	INP/ 139
Basellaceae	*Basella alba* L.	Couve manteiga	F	Vg	He	Sautéed with other foods		C	Sp	INP/ 202
Bignoniaceae	*Tabebuia caraiba* (Mart.)	Cariobeira	M	Fo	Tr	Tree bark tea	Inflammation	S	P	INP/ 208
	Mansoa alliacea (Lam.) A.H. Gentry	Cipó alho	Mf	Fo	Cl	M: tea and beverage of the leaves / F: cooked with other foods	Aches over the body	S	P	INP/ 177
	Tanaecium nocturnum (Barb. Rodr.)	Cipó curimbó	M	Fo	Cl	Leaf and bark tea	Protect against "evil eye"	S	P	IAN 134
	Bignonia exoleta Vell.	Cipó morceguinho (unha de morcego)	M	Fo	Cl	Stem tea	Headache and stomachache	S	P	IAC 251
	Crescentia cujete L.	Cuia	M	O	Tr	Leaf bath; bath with bark of *nazarana* tree and *C. deodara* with *S. guianensis* leaves	Flu and cold; fever and "evil eye"	S	P	INP/ 262
	Fridericia chica (Humb. & Bonpl.)	Pariri (crajiru, bariri)	M	Vg	He	Leaf tea; beverage of the leaves with bark of the *D. subcymosa*, and leaves of *P. americana* tree and of *G. hirsutum*	Anemia and gastritis	C	Sp	INP/ 268
	Tabebuia roseoalba (Ridl.) Sandwith	Pau d'arco	M	Fo	Tr	Put tree bark it in the water until it gets colored and drink it	Stomachache	S	P	INP/ 197
Bixaceae	*Bixa orellana* L.	Urucum	Mf	O	Sh	M: beverage of the seed with *H. courbaril* bark, *D. odorata* seed, *Z. mioga* and honey / F: food coloring	Flu, cough and pneumonia	S	Sp	INP/ 126

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
Bromeliaceae	*Ananas comosus* L.	Abacaxi	Mf	Ff	He	M: eat the fresh fruit or drink juice with milk / F: fresh fruit and juice	Kidney stone	C	Sp	INP/ 215
Burseraceae	*Protium heptaphyllum* (Aubl.) Marchand	Breu branco	M	Fo	Tr	Squeeze the green bark and drink the juice	Amoeba, diarrhea	S	P	INP/ 486
Cactaceae	*Hylocereus undatus* (Haw.) Britton & Rosa	Pitaíca	M	Fo	Tr	Spread plant milk on the cut or wound. In relation to hemorrhage, drink the milk	Stop cutting blood, wound and bleeding	S	P	IAN 143
Caesalpiniaceae	*Martiodendron elatum* (Ducke) Gleason	Jutaicica	M	Fo	Tr	Tree bark tea	Worm	S	P	INP/ 258
	Mora paraensis (Ducke)	Pracuuba	M	Fo	Tr	Tree bark tea	Diarrhea	S	P	INP/ 665
	Tachigalia paniculata Aublet	Taxizeiro	M	Fo	Tr	Beverage of the bark of the tree	Aches over the body	S	P	INP/ 598
Calophyllaceae	*Calophyllum brasiliense* Cambess.	Jacareúba	M	Fo	Tr	Put tree bark it in the water until it gets colored and drink it	Diabetes	S	P	INP/ 191
Caricaceae	*Carica papaya* L.	Mamão	Mf	O	Tr	M: tea of the roots with *E. foetidum* leaves and of *C. ambrosioides* leaves; mixture with honey and drink / F: fresh fruit	Worm; relieves cervical spine pain	S	Sp	INP/ 110
Caryocaraceae	*Caryocar villosum* (Aubl.) Pers.	Pequiá	F	Fo	Tr	Boiled fruit		S	P	INP/ 205
Caryophyllaceae	*Drymaria cordata* (L.) Wild.	Agrião selvagem	F	Vg	He	Leaves cooked with other foods		C	Sp	INP/ 216
Chrysobalanaceae	*Chrysobalanus icaco* L.	Juru	F	Rf	Tr	Fresh fruit		S	P	INP/ 134
	Licania tomentosa (Benth.) Fritsch	Macucu (oiti)	F	Fo	Tr	Fresh fruit		S	P	INP/ 449
	Couepia subcordata Benth.	Marí marí	F	Fo	Tr	Fresh fruit		S	P	INP/ 108
Clusiaceae	*Symphonia globulifera* L. f.	Anani	M	Fo	Tr	Use milk to clog the area of the strain	Muscle strain	S	P	INP/ 175
	Platonia insignis Mart.	Bacuri	F	Fo, O	Tr	Fresh fruit and juice		S	P	INP/ 238
	Platonia grandiflora Plach.	Bacuri açu	F	Fo	Tr	Fresh fruit and juice		S	P	NYE 273
	Garcinia madruno (Kunth) Hammel	Bacuri azedo	F	Fo	Tr	Fresh fruit and juice		S	P	INP/ 920
	Garcinia brasiliensis Mart.	Bacuri liso (bacurizinho)	F	Fo	Tr	Fresh fruit and juice		S	P	INP/ 989
	Vismia guianensis (Aubl.) Pers.	Lacre	M	Fo	Tr	Squeeze the juice from the leaves on the affected area	Mycosis and skin irritation	S	P	INP/ 178
Convolvulaceaea	*Ipomoea batatas* (L.)	Batata doce	F	Ff, O	Cr	Cooked		C, S	A	INP/ 388

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Ipomoea batatas (L.) *var.* Rainha	Batata rainha	F	Ff, O	Cr	Cooked		C, S	A	IAN 169
	Ipomoea purga (Wender.) Hayne	Batatão	M	Ff	Cr	Grind the rhizome, put it in the water until it gets colored and drink it	Elimination of toxic substances in the blood	C	A	MBl 214
Costaceae	*Costus spicatus* (Jacq.) Sw.	Cana ficha	M	O	Sh	Leaf and stem tea with *A. tenella* leaves, of *P. niruri* and of *A. muricata*; beverage of *V. surinamensis* bark with "mangangá" *M. acuminata*	Urinary tract infection; uterine infection	S	Sp	INP/ 268
Crassulaceae	*Kalanchoe brasiliensis* Cambess.	Pirarucu branco (são raimundo)	M	VG, O	He	Syrup: mixture the leaves with *Aloe* sp. and honey; leaf tea	Gastritis	C, S	Sp	IAN 165
	Bryophyllum pinnatum (Lam.) Oken	Pirarucu roxo (são raimundo)	M	Vg, O	He	Syrup: mixture the leaves with *Aloe* sp. and honey; leaf tea	Gastritis	C, S	Sp	INP/ 268
Cucurbitaceae	*Luffa operculata* (L.) Cogn.	Buchinha (cabacinha)	M	O	Cl	Cut the fruit, boil it in oil and massage the local; dried fruit tea with the root of the *P. angulata*, and leaves of *Q. amara* and *A. grandifolia*	Hematoma; malaria	C	Sp	INP/ 224
	Cucurbita pepo L.	Jerimum (abóbora)	Mf	Ff, O	Cr	M: stem tea / F: fruit cooked with other foods	Rheumatism	C, S	A	INP/ 235
	Cucumis anguria L.	Maxixe	Mf	Ff, O	Cr	Fruit cooked with other foods (M/F)	Cholesterol	C, S	A	INP/ 108
	Citrullus lanatus (Thunb.)	Melancia	Mf	Ff, O	Cr	M: grind the seed, put it in the water and drink it / F: fresh fruit	Stroke	C, S	A	INP/ 567
	Sicana odorifera (Vell.) Naudin	Melão caipira	F	Ff, O	Cl	Fresh fruit and juice		C, S	A	INP/ 897
Cyperaceae	*Cyperus articulatus* L.	Pripioca	M	Vg	He	Grind the rhizome, make bath or tea and massage the body	Aches over the body	C	Sp	INP/ 211
	Cyperus rotundus L.	Tiririca	M	Fo	He	Leaf tea, with *P. barbatus* and from *F. chica* leaves	Diabetes	S	P	INP/ 220
Dioscoreaceae	*Dioscorea dodecaneura* Vell.	Cará branco	F	Ff, O	Cl	Cooked rhizome		C, S	Sp	INP/ 192
	Dioscorea bulbifera L.	Cará do ar	F	Ff, O	Cl	Boiled fruit		C, S	Sp	MFS 814
	Dioscorea altissima Lam.	Cará mão de onça	F	Ff, O	Cl	Cooked rhizome		C, S	Sp	INP/ 200
	Dioscorea trifida L.f.	Cará roxo	F	Ff, O	Cl	Cooked rhizome		C, S	Sp	INP/ 234

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
Euphorbiaceae	*Hura crepitans* L.	Assacu	M	Fo	Tr	Drink the tree milk diluted in water	Combat and avoid cancer	S	P	INP/ 985
	Euphorbia tirucalli L.	Cachorro pelado	M	Ff, O	He	Drink the tree milk diluted in water	Combat and avoid cancer	C, S	Sp	HAN 016
	Omphalea diandra L.	Comadre do azeite (mãe de azeite)	Mf	Fo	Cl	M: grind the fruit, cook it, extract the oil and drink it / F: use the oil from the fruit to prepare the food	Asthma	S	P	INP/ 391
	Croton calycularis Huber	Esturaque	M	O	He	Syrup with honey, *D. odorata* seed with *P. amboinicus* leaves	Flu and cold	S	Sp	INP/ 187
	Manihot esculenta Crantz.	Macaxeira	F	Ff	Sh	Roots cooked with other foods		C	A	INP/ 179
	Sapium taburu Ule	Murupita	M	Fo	Tr	Spread the tree milk over the affected area	Stingray sting (*Brycon* sp.)	S	P	INP/ 206
	Jatropha curcas L.	Pião branco	M	O	Sh	Leaf bath, prepare a pill from the crushed seed; spread the milk from the plant over the wounded site; bath with *Citrus* and *O. campechianum* leaves, leave in the dew and wash your hair the next day	Migraine; wound healing; flu and cold	S	Sp	INP/ 224
	Jatropha molissima L.	Pião pajé	M	O	He	Fruit cooked with coffee; spread the milk of the plant over the wound, or drink tea from the leaves	Anti-inflammatory; heal wounds	S	Sp	EAC 160
	Jatropha gossypiifolia L.	Pião roxo	M	O	Sh	Tea and bath of the leaves, prepares a pill from the ground seed; spread the milk from the plant over the wounded site; bath with *Citrus* and *O. campechianum* leaves, leave in the dew and wash your hair the next day; Leaf bath, with *B. caapi* and *P. alliacea* leaves	Migraine; wound healing; flu and cold; "evil eye"	S	Sp	INP/ 187
	Hevea brasiliensis L.	Seringueira	Mf	Fo	Tr	M: use milk to clog the area of the strain / F: mixes the tree milk in the coffee and drinks	Muscle strain	S	P	INP/ 547

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
Fabaceae - caesalpinioideae	*Copaifera langsdorfii* Desf.	Copaíba	M	Fo	Tr	Beverage of the tree oil with *E. guineensis* roots and honey	Gastritis	S	P	INP/ 745
	Hymenaea courbaril L.	Jatobá (jutaí)	Mf	Fo	Tr	M: beverage with *D. odorata* and *B. orellana* seeds, *Z. mioga* and honey / F: fresh fruit	Flu, cough and pneumonia	S	P	INP/ 143
	Caesalpinia ferrea var. *cearensis* Huber.	Jucá	M	Fo	Tr	Leaf tea	Stomachache	S	P	IAN 112
	Senna alata (L.) Roxb.	Mata-pasto	M	Rf	Sh	Flower tea	Worm	S	P	INP/ 192
	Tamarindus indica L.	Tamarindo	F	Fo	Tr	Fresh fruit		S	P	INP/ 409
Fabaceae - cercideae	*Bauhinia rutilans* Spruce ex Benth.	Escada de jabuti	M	Fo	Cl	Tea or beverage of vine	Aches over the body	S	P	HAM 972
	Bauhinia splendens Kunth	Macaco cipó	M	Fo	Cl	Use milk to clog the area of the strain	Muscle strain	S	P	INP/ 888
Fabaceae - faboideae	*Dipteryx odorata* (Aubl.) Wild.	Cumaru	M	Fo	Tr	Beverage of *H. courbaril* bark, *B. orellana* seeds, *Z. mioga* and honey; syrup with honey, leaves *C. calycularis* and *P. amboinicus*	Flu, cough, pneumonia and could	S	P	INP/ 171
	Vicia faba L.	Faveira	M	Fo	Tr	Squeeze the seed oil into the skin with ringworm	Ringworm	S	P	MAI 129
	Erythrina falcata Benth.	Molongó	Mf	Fo	Tr	M: spread the tree milk on the affected area / F: fresh fruit	Eliminate the skin bug	S	P	UB 141
	Pterocarpus rohrii Vahl	Mututi	M	Fo	Tr	Tea; put it in the water until it gets colored and drink it	Anti-inflammatory	S	P	INP/ 335
	Canavalia boliviana Piper.	Papo de mutum	F	Fo	Tr	Fresh fruit		S	P	EAC 242
Fabaceae - leguminosae	*Vouacapoua americana* Aubl.	Acapu	M	Fo	Tr	Tree bark tea	Amoeba	S	P	INP/ 266
	Ormosia coutinhoi Ducke	Buiuçú	Mf	Fo	Sh	M: put tree bark it in the water until it gets colored and drink it / F: fresh fruit	S	P	INPA 140000	
	Dalbergia subcymosa Ducke.	Cipó verônica	M	Rf, O	Sh	Beverage: bark with and leaves of *P. americana*, *F. chica* and of *G. hirsutum*; or with bark of *espinheira santa*, *U. tomentosa* and *S. adstringens*	Gastritis and anemia	S	P	INP/ 248
Fabaceae - mimosoideae	*Pentaclethra macroloba* Wild. Kuntze	Pracaxi	M	Fo	Tr	Apply the oil over the infection	Skin infection	S	P	INP/ 135

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Stryphnodendron adstringens (Mart.) Covile	Barbatimão	M	Fo	Tr	Beverage of the bark tree with bark of *espinheira santa, U. tomentosa* and *D. subcymosa*	Gastritis	S	P	INPA 220
	Inga edulis Mart.	Ingá cipó	F	Rf	Tr	Fresh fruit		S	P	INPA 221
	Inga sessilis (Vell.) Mart.	Ingá macaco	F	Fo	Tr	Fresh fruit		S	P	VIC 523
	Inga vulpina Benth.	Ingá peludo	F	Fo	Tr	Fresh fruit		S	P	INPA 200
	Inga cinnamomea Spruce Ex Benth.	Ingá pracuúba	F	Fo	Tr	Fresh fruit		S	P	INPA 102
Fabaceae - papilionoideae	*Ateleia glazioveana* Baillon	Timbó	M	O	He	Rub the leaf milk over the distended area	Muscle strain	S	Sp	INPA 262
Goupiaceae	*Goupia glabra* Aubl.	Cupiuba	M	Fo	Tr	Drink the tree milk	Diabetes	S	P	INPA 684
Hippocrateaceae	*Salacia* sp.	Gogó de guariba	F	Fo	Sh	Fresh fruit		S	P	INPA 188
Humiriaceae	*Sacoglottis guianensis* Benth.	Achuá (chuá)	F	Fo	Tr	Fresh fruit		S	P	INPA 264
	Endopleura uchi (Huber) Cuatrec.	Uxi	Mf	Fo	Tr	M: Tree bark tea / F: fresh fruit	Diarrhea	S	P	INPA 125
	Sacoglottis amazonica Benth.	Uxirana	F	Fo	Tr	Fresh fruit		S	P	INPA 149
Icacinaceae	*Poraqueiba sericea* Tul	Marí	F	Fo	Tr	Fresh fruit		S	P	INPA 211
Iridaceae	*Eleutherine plicata* Herb.	Marupá (marupazinho)	M	Vg	He	Root tea; leaf tea, with *P. pilosa* leaves	Worm; diarrhea	C	Sp	INPA 106
Lamiaceae	*Rosmarinus officinalis* L.	Alecrim	Mf	Vg	He	M: leaf tea, with leaves *H. suaveolens* and *O. selloi*; mixture of the leaves with alcohol, leaves of *T. vulgare, R. graveolens* and *S. orientale* seeds / F: cooked with other foods	Diarrhea; stroke	C	Sp	EAF 124
	Ocimum campechianum Mill.	Alfavaca	Mf	Vg, O	He	M: cooked with other foods; bath with leaves *C. limonum* and *Jatropha* sp., leave in the dew and wash your hair the next day / F: cooked with other foods	Flu and cold	C, S	Sp	INPA 106

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Hyptis suaveolens (L.) Poit.	Alfazema	M	Vg	He	Leaf tea, with leaves R. officinalis and O. selloi; mixture with leaves, alcohol, leaves T. vulgare and R. graveolens; and Sesamum seeds	Diarrhea; stroke	C	Sp	INP/ 199
	Plectranthus barbatus Andrews	Boldo grande	M	Vg, O	He	Leaf tea, with leaves C. rotundus and F. chica	Diabetes	C, S	Sp	INP/ 224
	Plectranthus grandis (Cramer) R. Willense	Boldo pequeno	M	Vg, O	He	Leaf tea, with leaves C. rotundus and F. chica	Diabetes	C, S	Sp	HPL 362
	Marrubium vulgare L.	Desinflama	M	Vg, O	He	Leaf tea	Indisposition in the body	C, S	Sp	IAN 167
	Ocimum selloi Benth.	Elixir paregórico	M	Vg, O	He	Leaf tea, with leaves R. officinalis and R. officinalis; mixture with leaves, alcohol, leaves T. vulgare and R. graveolens; and Sesamum seeds	Diarrhea; stroke	C, S	Sp	IAC 443
	Melissa officinalis L.	Erva cidreira	Mf	Vg, O	He	M: leaf tea / F: cooked with other foods	Tranquilizer	C, S	Sp	IAN 359
	Plectranthus amboinicus (Lour.) Spreng.	Hortelã grande	Mf	Vg, O	He	M: syrup with honey, D. odorata seeds and C. calycularis leaves / F: cooked with other foods	Flu and cold	C, S	Sp	INP/ 268
	Mentha x villosa Huds.	Hortelanzinho	Mf	Vg, O	He	M: syrup with honey, D. odorata seeds and C. calycularis leaves / F: cooked with other foods	Flu and cold	C, S	Sp	EAC 541
	Ocimum basilicum L.	Manjericão	Mf	Vg, O	He	M: leaf tea and bath to wash your head / F: cooked with other foods	Flu and cold	C, S	Sp	HFS 273
	Origanum vulgare L.	Manjerona	M	Vg, O	He	Leaf tea	Headache	C, S	Sp	INP/ 147
	Pogostemon cablin Benth.	Oriza	M	Vg, O	He	Leaf tea	Aches over the body	C, S	Sp	INP/ 187
	Tetradenia riparia (Hochst.) Codd	Pluma	M	Vg, O	He	Leaf tea	Stomachache	C, S	Sp	EAF 121
	Scutellaria agrestis A. St.-Hil. ex Benth.	Trevo roxo (panana)	M	Vg, O	He	Squeeze the juice from the leaves on the ear	Ear pain	C, S	Sp	INP/ 235

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Mentha spicata L.	Vique grande	M	Vg, O	He	Leaf tea	Headache	C, S	Sp	INP/ 233
	Mentha arvensis L.	Vique pequeno	M	Vg, O	He	Leaf tea	Headache	C, S	Sp	IAN 112
Lauraceae	*Persea americana* Mill.	Abacate	Mf	O	Tr	M: leaf tea; beverage of leaves with *D. subcymosa* bark, and *F. chica* and *G. hirsutum* leaves / F: fresh fruit and juice	Rheumatism; gastritis and anemia	C	P	INP/ 280
	Cinnamomum zeylanicum Blume	Canela	Mf	O	Tr	Leaf tea (M/F)	Tranquilizer	S	P	EAF 133
	Aniba canelilla (Kunth)	Preciosa	Mf	O	Tr	Leaf tea (M/F)	Stomachache	S	P	IAN 146
Lecythidaceae	*Bertholletia excelsa* H.B.K.	Castanha-do-brasil	Mf	Fo	Tr	M: put tree bark it in the water until it gets colored and drink it; leaf tea with *C. citratus* and *E. oleracea* root, and *C. nucifera* / F: fresh almonds	Amoeba; hepatitis	S	P	INP/ 778
	Couroupita guianensis Aubl.	Curupita	M	Fo	Tr	Spread the tree milk under the affected area	Stingray sting (*Brycon* sp.), scorpion and snake	S	P	INP/ 159
	Lecythis pisonis Cambess.	Sapucaia	Mf	Fo	Tr	M: put tree bark it in the water until it gets colored and under the affected area - / F: fresh almonds	Ringworm	S	P	INP/ 161
Loganiaceae	*Spigelia anthelmia* L.	Lombrigueira	M	Fo	He	Leaf tea	Worm	S	P	INP/ 104
Malpighiaceae	*Banisteria caapi* (Spruce ex Griseb.)	Cabi	M	Fo	Tr	Leaf tea with *J. gossypiifolia* and *P. alliacea* leaves	S		P	RFA 5243
	Byrsonima crassifolia (L.) Kunth	Muruci	F	Fo	Tr	Fresh fruit and juice		S	P	INP/ 187
Malvaceae	*Gossypium hirsutum* L.	Algodão branco	M	O	Sh	Beverage of leaf with bark *D. subcymosa*, *F. chica* and *P. americana*; grind the seed with milk and drink it	Gastritis, anemia; babies vomiting	S	Sp	INP/ 106
	Herrania mariae (Mart.) Decne. ex Goudot	Cacauí (cacau jacaré)	F	Fo	Tr	Fresh fruit		S	P	INP/ 378
	Theobroma subincanum Mart.	Cupuí	F	Fo	Tr	Fresh fruit		S	P	INP/ 200

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Althaea officinalis L.	Malvarisco	M	Vg	He	Grind the leaf, spread the gel on the place and tie with cloth	Stop injury blood	C	Sp	IAC 561
	Pachira aquatica Aubl.	Mamorana	F	Fo	Tr	Boiled almonds		S	P	INP/ 212
	Abelmoschus esculentus L. Moench	Quiabo	Mf	Ff, Vg	Sh	M: dried fruit tea / F: cooked with other foods	Postpartum treatment	C	A	EAF 108
	Hibiscus sabdariffa L.	Vinagreira	Mf	O	Sh	M: dried fruit tea / F: cooked with other foods	Tranquilizer	S	Sp	INP/ 570
Marantaceae	*Calathea allouia* (Aubl.) Lindl	Ariá	F	Ff	He	Cooked rhizome		C	A	EAF 524
Melastomataceae	*Mouriri grandiflora* D.C.	Camutim	F	Fo	Sh	Fresh fruit		S	P	INP/ 146
Meliaceae	*Carapa guianensis* Aubl.	Andiroba	M	Fo	Tr	Beverage of oil extracted from the stem with bee honey and leaves of *A. oleracea*	Sore throat and flu	S	P	INP/ 158
	Guarea guidonia (L.) Sleumer	Jataúba	M	Fo	Tr	Cooked root with other foods	To clean the intestine	S	P	INP/ 118
Menispermaceae	*Abuta grandifolia* L.	Bôta	M	Rf	Cl	Leaf tea with *P. angulata* root, *Q. amara* leaf and *L. operculata* fruit dried	Malaria	S	P	INP/ 943
Monimiaceae	*Siparuna guianensis* L.	Capitiú	M	Vg	He	Tree bark tea; bath with bark of *nazarana* tree and *C. deodara* with *C. cujete* leaf	Flu and headache; fever and "evil eye"	C	Sp	INP/ 165
Moraceae	*Brosimum potabile* Ducke.	Amapá doce	Mf	Fo	Tr	Collect the milk from the tree, beat it to remove the foam and drink it, mashed or with coffee (M/F)	Gastritis	S	P	INP/ 763
	Ficus insipida Willd.	Apuí (caxinguba)	M	Fo	Tr	Use milk to clog the area of the strain	Muscle strain	S	P	INP/ 399
	Artocarpus camansi Blanco	Fruta pão	Mf	Fo	Tr	M: Use milk to clog the area of the strain / F: cooked fruit	Muscle strain	S	P	INP/ 280
	Artocarpus heterophyllus Lam.	Jaca	F	O	Tr	Fresh fruit		S	P	INP/ 192
Musaceae	*Musa paradisiaca* L.	Banana (bananeira)	Mf	O	Sh	M: Bath: dry leaves with *E. oleracea* and *C. nucifera*, with *M. indica* peel and *C. citratus* leaf / F: fresh fruit	Bathe woman after childbirth	C	Sp	INP/ 199

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Musa acuminata L.	Banana roxa	Mf	O	Sh	M: Bath: dry leaves with *E. oleracea* and *C. nucifera*, with *M. indica* peel and *C. citratus* leaf; beverage with *mangangá* and *C. spicatus* leaves and *V. surinamensis* bark / F: fresh fruit	Bathe woman after childbirth; uterus infection	C	Sp	OUF 303
Myristicaceae	*Virola surinamensis* (Rol. ex Rottb.) Warb.	Virola, ucuuba, bucuuba	M	Fo	Tr	Beverage of the bark tree with *C. spicatus* leaves and *M. acuminata mangangá*	Uterus infection	S	P	INP/ 573
Myrtaceae	*Syzygium cumini* (L.) Skeels	Ameixa	Mf	O	Tr	M: tree bark tea / F: fresh fruit	Diarrhea	S	P	INP/ 268
	Psidium cattleianum Sabine	Araçá	F	O	Sh	Fresh fruit		S	P	EAF 122
	Syzygium aromaticum (L.) Merr. & L.M. Perry	Cravo arvore	Mf	Fo	Tr	Tree bark tea (M/F)	Stomachache, intestinal constipation	S	P	IAC 534
	Eugenia victoriana Cuatrec.	Ginja	F	Rf	Tr	Fresh fruit		S	P	HPL 612
	Psidium guajava L.	Goiaba	Mf	O	Sh	M: tree bark tea / F: fresh fruit	Diarrhea	S	P	INP/ 237
	Syzygium malaccense (L.) Merr. & L.M. Perry	Jambo	F	O	Tr	Fresh fruit		S	P	INP/ 214
Olacaceae	*Ptychopetalum uncinatum* Anselmino	Marapuama	M	Rf	Tr	Mixture of the tree bark with alcohol and massage	Crab and rheumatism	S	P	INP/ 958
Oxalidaceae	*Averrhoa carambola* L.	Carambola	F	O	Sh	Fresh fruit and juice		S	P	INP/ 224
	Averrhoa bilimbi L.	Limão caiana	F	O	Sh	Food flavoring		S	P	INP/ 146
Passifloraceae	*Passiflora micropetala* Mart. ex Mast.	Maracujá de paca	F	O	Cl	Fresh fruit		S	Sp	EAF 279
	Passiflora nitida Kunth	Maracujá do mato (de cheiro)	F	Fo	Cl	Fresh fruit		S	Sp	INP/ 154
	Passiflora quadrangularis L.	Maracujá peroba	F	Ff	Cl	Fresh fruit		C	Sp	INP/ 698
Pedaliaceae	*Sesamum orientale* L.	Gergelim branco	Mf	Ff	He	M: mixture with seeds, alcohol, leaves from *T. vulgare*, *R. graveolens* and *R. officinalis* / F: make *paçoca* from the seeds	Diarrhea; stroke	C	A	EAF 472

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Sesamum indicum L.	Gergelim preto	Mf	Ff	He	M: mixture with seeds, alcohol, leaves from *T. vulgare*, *R. graveolens* and *R. officinalis* / F: make *paçoca* from the seeds	Diarrhea; stroke	C	A	INP/ 206
Phyllanthaceae	*Phyllanthus niruri* L.	Quebra pedra	M	Vg	He	Leaf tea (or *G. arborescens* leaves), leaves from *A. tenella*, *C. spicatus* and *A. muricata*	Urinary tract infection, kidney stones	C	Sp	INP/ 193
	Petiveria alliacea L.	Mucuracaá	M	Vg	He	Leaf tea with *J. gossypiifolia* and *B. caapi* leaves; beverage with leaves	"evil eye"; gastritis	C	Sp	INP/ 259
Pinaceae	*Cedrus deodara* L.	Cedro	M	Fo	Tr	Bark tea; bath: tree bark, with *nazarana* bark, and leaves from *S. guianensis* and *C. cujete*	Tranquilizer and Stomachache; fever and "evil eye"	S	P	ICN 128
Piperaceae	*Peperomia pellucida* (L.) Kunth	Comida de jabuti	Mf	Vg, O	He	M: leaf and stem tea / F: sautéed with other foods	Infection	S	A	INP/ 338
	Piper callosum Ruiz & Pav.	Óleo elétrico	M	O	He	Leaf tea	Migraine and sting of insects	S	Sp	INP/ 243
Plantaginaceae	*Scoparia dulcis* L.	Vassourinha	M	O	He	Squeeze the juice from the leaves on the affected area	Mycosis and skin irritation	S	Sp	INP/ 580
Poaceae	*Bambusa vulgaris* Schrad.	Bambu	M	Fo	Tr	Leaf tea	Arterial hypertension	S	P	IAN 197
	Saccharum spp. L.	Cana	Mf	Ff	Sh	Drink the juice from the stem (M/F)	Malaise and indisposition	C	Sp	IAN 626
	Cymbopogon citratus (DC.) Stapf	Capim marinho (capim santo)	Mf	Vg	He	M: leaf bath with dry leaves from *M. paradisíaca*, *E. oleracea* and *C. nucifera*, with *M. indica* peel; leaf tea from *C. winterianus* with *E. oleracea* root, and *C. nucifera* and *B. excelsa* peel / F: leaf tea	Bathe woman after childbirth; hepatitis	C	Sp	INP/ 268
	Cymbopogon winterianus Jowitt ex Bor	Eucalipto	M	Vg	He	Leaf tea with raiz *C. citratus* and *E. oleracea* root, and *C. nucifera* and *B. excelsa* peel	Hepatitis	C	Sp	IAN 194
	Guadua weberbaueri Pilg.	Tabuqui	M	Fo	Sh	Chew and swallow the apical bud of the plant	Sting of insects	S	P	INP/ 261
Portulacaceae	*Portulaca pilosa* L.	Amor crescido	M	Vg	He	leaf tea with *E. plicata* leaves	Diarrhea	C	Sp	INP/ 177

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Portulaca grandiflora L.	Onze-horas	M	Vg	He	Leaf tea	Arterial hypertension	C	Sp	INP/ 567
Rhamnaceae	*Houvenia dulcis* Thunberg.	Pau doce	M	Fo	Tr	Bark tea	Headache	S	P	MA(269
Rosaceae	*Licania macrophylla* Benth.	Anauerá	M	Fo	Tr	Put tree bark it in the water until it gets colored and drink it	Stomachache and amoeba	S	P	IAN 113
Rubiaceae	*Genipa americana* L.	Jenipapo	Mf	Fo	Tr	Fresh fruit and juice (M/F)	Cholesterol	S	P	INP/ 187
	Morinda citrifolia L.	Noni	M	O	Sh	Leaf tea	Aches over the body	S	P	INP/ 237
	Calycophyllum spruceanum (Benth.) K.	Pau mulato	M	O	Tr	Bark tea	Stomachache and amoeba	S	P	INP/ 253
	Alibertia sorbilis Ducke	Puruí	F	Rf	Tr	Fresh fruit		S	P	INP/ 165
	Cinchona calisaya Weed.	Quinarana	M	Fo	Tr	Root tea	Fever	S	P	IAC 628
	Uncaria tomentosa (Willd) D. C.	Unha de gato (jupindá)	M	Rf	Cl	Beverage of the bark of the vine with bark from *espinheira santa*, *D. subcymosa* and *S. adstringens*	Gastritis	S	P	INP/ 552
Rutaceae	*Ruta graveolens* L.	Arruda	M	Vg	He	Leaves mixture with alcohol, leaves from *T. vulgare* and *O. campechianum*, and *Sesamum* seeds	Diarrhea; stroke	C	Sp	INP/ 100
	Citrus sinensis L. Osb.	Laranja	Mf	O	Tr	M: leaf tea with *A. esperanzae* / F: fresh fruit and juice	Gases	S	P	INP/ 161
	Citrus aurantium L.	Laranja da terra	M	O	Tr	Eat the fresh fruit with bee honey	Anemia	S	P	INP/ 409
	Citrus limettioides Tan	Lima	Mf	O	Tr	M: tree bark tea / F: fresh fruit	Arterial hypertension	S	P	HPL 712
	Citrus limonum L.	Limão	Mf	O	Tr	M: cooked with other foods; bath leaves from *O. campechianum* and *Jatropha*, leave in the dew and wash your hair the next day / F: use it in sauces and broths	Flu and cold	S	P	MAI 317
Sapindaceae	*Talisia esculenta* (A.St.-Hil.) Radlk	Pitomba	F	Fo	Sh	Fresh fruit		S	P	INP/ 126
Sapotaceae	*Pouteria caimito* (Ruiz & Pav.) Radlk.	Abiu	F	Fo	Tr	Fresh fruit		S	P	INP/ 107

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg
	Pouteria pachyphylla Pires	Abiurana	F	Fo	Tr	Fresh fruit		S	P	INP/ 457
	Pouteria macrophylla (Lam.) Eyma	Cutite	F	Fo	Sh	Fresh fruit		S	P	INP/ 130
Sapotaceae	*Manilkara huberi* (Ducke) Stand.	Maçaranduba	Mf	Fo	Tr	M: drink the tree milk / F: fresh fruit	Improves the sight	S	P	INP/ 103
Simaroubaceae	*Simarouba amara* Aubl.	Jaruba (aruba, marupá)	M	Fo	Tr	Bark tea	Worm	S	P	INP/ 103
	Simarouba versicolor A. St. -Hil.	Pau chave	M	Fo	Tr	Put tree bark it in the water, leave in the dew, remove the foam and drink it	Malaria	S	P	INP/ 124
	Quassia amara L.	Quina	M	Fo	Tr	Leaf and bark tea	Malaria	S	P	INP/ 415
Solanaceae	*Physalis angulata* L.	Camapu	Mf	Ff	He	Root tea, leaves from *Q. amara* and *A. grandifolia*, and *L. operculata* fruit dried	Malaria	S	A	INP/ 106
	Solanum sessiliflorum Dunal	Cubiu	F	Fo	Sh	Fresh fruit		S	P	INP/ 207
	Capsicum frutescens L.	Pimenta malagueta	Mf	Vg	He	M: grind the leaf with *C. cyminum* and *P. nigrum* seeds / F: food flavoring	Labor pain	C	Sp	MIR 580
	Solanum americanum Mill.	Pretinha	F	Rf	He	Fresh fruit		S	P	INP/ 109
Talinaceae	*Talinum paniculatum* (Jacq.) Gaertn.	Cariru grande	F	Vg, Ff	He	Leaf cooked with other foods		C	Sp	INP/ 163
	Talinum triangulare (Jacq.) Willd.	Cariru pequeno	F	Vg, Ff	He	Leaf cooked with other foods		C	Sp	INP/ 259
Urticaceae	*Cecropia pachystachya* Trécul	Embaúba	M	Rf	Tr	Grind the leaf, put it in the water and drink it	Diabetes	S	P	INP/ 109
Verbenaceae	*Lippia alba* (Mill.) N.E. Br.	Carmelitana	Mf	Vg	He	M: leaf tea / F: leaf cooked with other foods	Headache	C	Sp	EAF 121
Vitaceae	*Cissus verticillata* (L.) Nicolson & C.E. Jarvis	Cipó pucá	M	Fo	Cl	Bark tea	Stomachache	S	P	INP/ 167
	Cissus sicyoides L.	Insulina	M	Vg	He	Leaf tea	Diabetes	C	Sp	EAF 132
Zingiberaceae	*Zingiber mioga* (Thunb.) Roscoe	Gengibre grande	Mf	Vg, O	He	M: beverage: *H. courbaril* leaves, *D. odorata* and *B. orellana* seeds, and honey / F: tea from the rhizome	Flu, cough and pneumonia	C	Sp	INP/ 570

Botanical family	Scientific name	Popular name	Cat.	Env.	Grow.	Forms of use	Medicinal indications	Dom.	Veg.	Reg.
	Zingiber officinale Roscoe	Gengibre pequena	Mf	Vg, O	He	M: beverage: *H. courbaril* leaves, *D. odorata* and *B. orellana* seeds, and honey / F: tea from the rhizome	Flu, cough and pneumonia	C	Sp	INPA 186
Not identified	Not identified	Aririmba (ariramba)	F	Fo	Tr	Fresh fruit		S	P	–
Not identified	Not identified	Bolota	F	Fo	Sh	Fresh fruit		S	P	–
Not identified	Not identified	Copaíba de planta	M	Vg	He	Tea and syrup of the leaves	Headache and cough	C	Sp	–
Not identified	Not identified	Cumaru de planta	M	Vg	He	Syrup of the leaves	Pneumonia	C	Sp	–
Not identified	Not identified	Espinheira santa	M	Fo	Tr	Beverage of the bark tree with bark of *S. adstringens*, *U. tomentosa* and *D. subcymosa*	Gastritis	S	P	–
Not identified	Not identified	Japá	M	Fo	Tr	Drink the tree milk	Gastritis	S	P	–
Not identified	Not identified	Larém (aralém)	M	Vg	He	Leaf tea	Malaria	C	Sp	–
Not identified	Not identified	Lua	F	Rf	Cl	Fresh fruit		S	P	–
Not identified	Not identified	Nazarana	M	Fo	Tr	Bath: tree bark, *C deodara* bark, *S. guianensis* and *C. cujete* leaves	Fever and "evil eye"	S	P	–
Not identified	Not identified	Papagainho	M	Vg	He	Leaf tea	Worm	C	Sp	–
Not identified	Not identified	Pichona	F	Fo	Sh	Fresh fruit		S	P	–
Not identified	Not identified	Pracapeá	F	Rf	Tr	Fresh fruit		S	P	–
Not identified	Not identified	Pranari	F	Rf	Tr	Fresh fruit		S	P	–

(Cat.) = Category of use, (Env.) = Propagation environment, (Grow.) = Growth habit, (Dom.) = Domestication stage, (Veg.) = Vegetative cycle, (Reg.) = Registration plant species, (M) = Medicinal, (F) = Food, (Mf) = Medicinal and Food, (Vg) = Vegetable garden, (O) = Orchard, (Fo) = Forest, (Ff) = Family farm, (Rf) Riparian forest (Tr) = Tree, (Sh) = Shrub, (He) = Herbaceous, (Cr) = Creeper, (Cl) = Climbers, (C) = Cultivated, (S) = Spontaneous, (P) = Perennial, (Sp) = Semi-perennial, (A) = Annual

The informants reported the existence of some medicinal and food species that are toxic. In this case, they developed some techniques that resulted from the knowledge inherited from their parents. Two examples are cited, the first is the use of *Aristolochia cymbifera* Mart. & Zucc., a medicinal species indicated for stomachache and headaches. According to the informants, the ingestion of the raw leaf can cause nausea, vomiting and dizziness. In this case, the "poison" is eliminated through the decoction of the leaves. The second example, is the species *Solanum americanum* Mill., whose fruit is consumed as food, however it is only ingested when it reaches full maturity, defined by the dark color. If consumed before this stage of maturation, it can cause fever, headache and diarrhea.

Regarding the forms of use, particularly for food plant species, it was observed that fruit species are mostly consumed in its fresh form (*Endopleura uchi* (Huber) Cuatrec., *Bactris acanthocarpa* Mart.) and in some cases they are prepared as juices (*Oenocarpus bacaba* Mart., *Oenocarpus mapora* Karsten). Rhizome-producing species are cooked and usually consumed in the breakfast (*Dioscorea trifida* L.f., *Arracacia xanthorriza* Bancr.) and vegetables are cooked with other foods (*Eryngium foetidum* L., *Hibiscus sabdariffa* L.).

This survey did not identify the habit of preparing salads with vegetables. However, it was observed that some seeds are used as condiments (*Bixa orellana* L.), paçoca (*Sesamum orientale* L.) and consumed in fresh (*Bertholletia excelsa* HBK) and, finally, some of these species are consumed in the form of boiled teas (cooking), during breakfast (*Cymbopogon citratus* (DC.) *Stapf*, *Cinnamomum zeylanicum* Blume).

Regarding the forms of use of medicinal species by the population, there was also a diversity of forms of preparation. They are explained, as it follows:

Beverage

It consists in boiling dry barks of trees and vines. The boiling process takes around 1 hour. After boiling, it is allowed to cool to room temperature overnight and then it is consumed. It is usually indicated for pain, inflammation and different infections in the body. Another way to prepare the beverage is to expose the preparation (water + plant) to the sunlight for 10 to 15 days, until the beverage is completely fermented. The preparation of beverage from medicinal plants

is mentioned in several works in the academic literature. It has been even carried out by community members in the wake of a conservation unit in the Caatinga [53, 56].

Tree bark sauce

It is widely used for stomachache, diarrhea and ringworm (in this case, the use does not occur through ingestion, but by topical application). This practice is similar to making teas; however, it is used only with the bark of the trees, and the water is not boiled. It should be observed that the bark must be immediately removed from the plant and immersed in water, remaining long enough to color the water using the plant's natural dye, and then it is ingested [32].

Mixture

It is widely used for headache, dizziness, diarrhea, stroke, among other discomforts. It consists of mixing the species indicated for this type of discomfort, fermenting them in alcohol, then putting them in a bottle, and inhaling it. Another form of use for body aches is to massage the sore spot with the mixture. This method is similar to the *garrafada*, the difference is that the fermentation of the beverage occurs in alcohol, while the fermentation takes place in water, under boiling or at room temperature.

Bath (maceration): It is used mainly against flu and cold. They consist of mashing the leaves of the species indicated for this discomfort by hand, immersing them in water, and exposing them in dew overnight. The next morning, wash the head with the beverage. Another possibility for preparing the *baths*: it can be cooked, with the leaves mashed using the hands, boil them for approximately one hour, leave it in the dew overnight, and use it the next day. It is a form widely used in several regions in Brazil [32, 56].

Teas: It is used for medicinal and food purposes. Preparation: leaves or peels are immersed in water during boiling. Generally, medicinal teas are prepared with leaves of various species indicated for a certain discomfort, and in food teas, with one species. This is the form of use most practiced by rural populations, also known as decoction [53].

Syrup

It is called licker, usually indicated to cure the flu. It is prepared from an oil (*Carapa guianensis* Aubl.), using leaves of some medicinal plant indicated for flu and bee honey. Boil everything together for 30 minutes, then let it cool, and gradually take a spoon three times a day [53, 56].

Juice of the leaves and seeds

It consists of grinding the leaf or seed of the species indicated for a particular disease, and ingesting it. It is indicated for symptoms of diarrhea, intestinal parasites and anemia, etc. You can also place it on the site of discomfort when it comes to ringworm, ear pain, etc. This form of use of medicinal plants was observed in riverside communities in the municipality of Manacapuru, state of Amazonas, Brazil [45].

Tree milk

It is extracted from the stem of forest species for food and medicinal purposes [57]. In relation to food use, the milk is ingested. In a medical case (ulcer, gastritis, inflammation), it can be ingested or placed over the place where the discomfort occurs (vision problems, toothache, blood stasis, insect bites). It is noteworthy the use of this resource as medicinal to treat muscle strain [58].

Oil

It is used for food and medicinal purposes. It is generally used as a condiment in the preparation of food and frying. In medicinal use, it is ingested both fresh and in bottles. The oils are extracted from both the stem of forest species and fruits and seeds. Its use is quite common in popular medicine in the Brazilian Amazon [59].

Plant sap

It can be either the stem sap (*Montrichardia linifera* Schott., Saccharum spp. L.), or the leaves (*Cecropia pachytachya* Trécul). They are collected from the plant species and consumed immediately after it. It is indicated for problems in the spleen, gastritis, malaise and indisposition in the body [59].

Ethnobotanical indices

The *Shannon-Wiener* biological diversity index and the *Pielou* equitability index were equal to 5.02 and 0.90, respectively. According to Hammer, Haper, Ryan, these are considered high [60]. It was observed the high richness of species of food and medicinal plants in the region under study, and that the knowledge about the use of these species is widely distributed among users of these plant species. This high diversity of plants may be the result of the high ethnobotanical knowledge that traditional, *quilombola* and indigenous populations develop through a combination of African, Amerindian and European knowledge about plants [30].

The results found for the diversity and equitability indexes in this study are superior to those found by Silva, Tamashiro, Begossi in work carried out with traditional populations in the Amazon [61]. These authors found 425 plant species used for medicinal, food, construction, ritual and ornamental purposes, and obtained the *Shannon-Wiener* index equal to 4.71. Kainer, Duryea also in a study carried out on plant resources in a conservation unit similar to this study, but only with women, found 145 plant species used for medicinal, food, construction, ritual and ornamental purposes, and obtained the indices of *Shannon-Wiener* and *Pielou* equal to 4.8 and 0.97, respectively [62]. In this last work analyzed, the *Shannon-Wiener* index was lower than that of the present study, and the

Pielou index was higher due to the greater diversity of species. However, knowledge about the use of species was better distributed and less concentrated among informants.

There are works carried out in the Amazon and in other biomes in Brazil that show similar diversity and equitability indices, such as the one carried out by Amorozo, Gély who obtained *Shannon-Wiener* and *Pielou* indices equal to 5.07 and 0.94, respectively with 17 informants in an ethnobotanical survey carried out only on medicinal plants [63]. In addition, works carried out in other biomes in Brazil registered *Shannon-Wiener* and *Pielou* indexes more expressive than those already found [64, 65, 66].

The species *Eryngium foetidum* L. (Apiaceae) and *Ipomoea batatas* (L.) (Convolvulaceaea) were the most cited by the informants (Table 4) in this study. Also, they obtained a relative citation frequency of 19.70 and 19.33, respectively. The fact that these species are the most cited means that they are the best known [31]. By observing the most cited species (Table 4), it is found that they are species grown close to the households, in domestic gardens or in the fields. They occur spontaneously in the orchards next to the residences. The fact that *Eryngium foetidum* L. (Apiaceae), for example, has a dual purpose of use (food and medicine), it can contribute to making it better known and demanded by the informants on a daily basis. These species occur significantly in other studies on food and medicinal resources in the Amazon region [45, 67] and other biomes in Brazil [68].

The Use Value Index of the species (Table 4) is ratified by the number of citations and the relative frequency of citations, that is, it is calculated considering the citations of the species by the number of informants in the research. The results show how much the species is demanded. The species with the highest relative frequency of citation will also be those with the highest indices of use value, that is, those most demanded by the feeding strategies and local phytotherapy of these informants on a daily basis [29].

It is worth noting that the higher the use value of these species, the greater the pressure of use upon them [69, 70]. In the specific case of this study, this analysis is very relevant, especially for the species found in the forest, whose reproduction process is more complex, and for most of them there is still no elaborated agronomic protocol.

Table 4
Relative frequency (Fr) and Value of Use Index (VUI) of the species of food and medicinal plants found in the Cajari River Extractive Reserve, Amazon, Brazil.

Species	Cit.	Fr	IVU
Chicória (*Eryngium foetidum* L.)	53	19.70	0.95
Batata doce (*Ipomoea batatas* (L.))	52	19.33	0.93
Cará roxo (*Dioscorea trifida* L.f.)	48	17.84	0.86
Andiroba (*Carapa guianensis* Aubl.)	47	17.47	0,84
Bacaba (*Oenocarpus bacaba* Mart.)	45	16.73	0.80
Pequiá (*Caryocar villosum* (Aubl.) Pers.)	43	15.99	0.77
Cipó verônica (*Dalbergia subcymosa* Ducke.)	42	15.61	0.75
Uxi (*Endopleura uchi* (Huber) Cuatrec.); Pracaxi (*Pentaclethra macroloba* Wild. Kuntze); Cariru grande (*Talinum paniculatum* (Jacq.) Gaertn.); Açaí (*Euterpe oleracea* Mart.)	40	14.87	0.71
Copaiba langsdorfii Desf.	39	14.50	0.70
Jambu (*Acmella oleracea* (L.) R.K. Jansen); Cominho (*Cuminum cyminum* L.); Camapu (*Physalis angulata* L.); Amapá doce (*Brosimum potabile* Ducke.)	38	14.13	0.68
Astrocaryum aculeatum G. Mey.	37	13.75	0.66
Fruta pão (*Artocarpus camansi* Blanco); Arruda (*Ruta graveolens* L.)	36	13.38	0.64
Unha de gato (jupindá) (*Uncaria tomentosa* (Willd) D. C.); Maxixe (*Cucumis anguria* L.); Hortelanzinho (*Mentha x villosa* Huds.)	35	13.01	0.63
Miriti (*Mauritia flexuosa* L.f.); Mastruz (*Chenopodium ambrosioides* L.)	34	12.64	0.61
Hortelã grande (*Plectranthus amboinicus* (Lour.) Spreng.); Alfavaca (*Ocimum campechianum* Mill.)	33	12.27	0.59
Macaxeira (*Manihot esculenta* Crantz.); Capim marinho (capim santo) (*Cymbopogon citratus* (DC.) Stapf)	32	11.90	0.57
Taperebá (cajá) (*Spondias mombin* L.); Ingá cipó (*Inga edulis* Mart.)	29	10.78	0.52
Peão branco (*Jatropha curcas* L.); Caju (*Anacardium occidentale* L.); Amapá amargo (*Parahancornia fasciculata* (Poir) Benoist.)	28	10.41	0.50
Jatobá (jutaí) (*Hymenaea courbaril* L.); Catinga de mulata (*Tanacetum vulgare* L.); Caranã (*Mauritiella armata* L.); Boldo pequeno (*Plectranthus grandis* (Cramer) R. Willense); Bacuri (*Platonia insignis* Mart.)	27	10.04	0.48
Marupá (marupazinho) (*Eleutherine plicata* Herb.); Erva cidreira (*Melissa officinalis* L.); Ameixa (*Syzygium cumini* (L.) Skeels)	26	9.67	0.46
Gengibre grande (*Zingiber mioga* (Thunb.) Roscoe); Camutim (*Mouriri grandiflora* D.C.); Babosa pequena (*Aloe vera* (L.) Burn. f.); Amor crescido (*Portulaca pilosa* L.)	25	9.29	0.45
Jerimum (abóbora) (*Cucurbita pepo* L.); Gengibre pequena (*Zingiber officinale* Roscoe); Cipó pra tudo (*Aristolochia esperanzae* Kuntze)	24	8.92	0.43
Tajoba (*Xanthosoma taioba* E.G. Gonç.); Preciosa (*Aniba canelilla* (Kunth) Mez); Pirarucu branco (são raimundo) (*Kalanchoe brasiliensis* Cambess.); Limão (*Citrus límonum* L.); Boldo grande (*Plectranthus barbatus* Andrews); Ariá (*Calathea allouia* (Aubl.) Lindl)	23	8.55	0.41
Castanha-do-pará (*Bertholletia excelsa* H.B.K.)	22	8.18	0.39
Cariru pequeno (*Talinum triangulare* (Jacq.) Willd.)	21	7.81	0.38
Cacauí (cacau jacaré) (*Herrania mariae* (Mart.) Decne. ex Goudot); Apuí (caxinguba) (*Ficus insipida* Willd.)	20	7.43	0.36
Quina (*Quassia amara* L.); Canela (*Cinnamomum zeylanicum* Blume)	19	7.06	0.34
Mucuracaá (*Petiveria alliacea* L.)	18	6.69	0.32
Escada de jabuti (*Bauhinia rutilans* Spruce ex Benth.); Cumaru (*Dipteryx odorata* (Aubl.) Wild.); Cipó alho (*Mansoa alliacea* (Lam.) A.H. Gentry);	17	6.32	0.30
Papagainho - not identified; Cupuí (*Theobroma subincanum* Mart.)	16	5.95	0.29
Peão roxo (*Jatropha gossypiifolia* L.); Pariri (crajiru, bariri) (*Fridericia chica* (Humb. & Bonpl.)); Manjericão (*Ocimum basilicum* L.); Anani (*Symphonia globulifera* L. f.)	15	5.58	0.27
Virola (ucuuba, bucuuba) (*Virola surinamensis* (Rol. ex Rottb.) Warb.); Sucuuba (*Himatanthus drasticus* (Mart.)); Sapucaia (*Lecythis pisonis* Cambess.); Quiabo (*Abelmoschus esculentus* L. Moench); Pupunha (*Bactris gasipaes* (kunth)); Graviola (*Annona muricata* L.); Carmelitana (*Lippia alba* (Mill.) N.E. Br.); Anador (*Justicia pectoralis* var. *stenophylla* Leonard)	14	5.20	0.25
Quebra pedra (*Phyllanthus niruri* L.); Oriza (*Pogostemon cablin* Benth.); Goiaba (*Psidium guajava* L.); Gogó de guariba (*Salacia* sp.); Cedro (*Cedrus deodara* L.); Anauerá (*Licania macrophylla* Benth.); Algodão branco (*Gossypium hirsutum* L.)	13	4.83	0.23
Laranja (*Citrus sinensis* L Osb.); Couve manteiga (*Basella alba* L.); Cipó puçá (*Cissus verticillata* (L.) Nicolson & C.E. Jarvis)	12	4.46	0.21
Noni (*Morinda citrifolia* L.); Ginja (*Eugenia victoriana* Cuatrec.); Cutite (*Pouteria macrophylla* (Lam.) Eyma); Cravo arvore (*Syzygium aromaticum* (L.) Merr. & L.M. Perry); Cana ficha (*Costus spicatus* (Jacq.) Sw.); Babosa grande (*Sansevieria trifasciata* Bojer)	11	4.09	0.20

Species	Cit.	Fr	IVU
Abacate (*Persea americana* Mill.)	10	3.72	0.18
Seringueira (*Hevea brasiliensis* L.); Mucajá (*Acrocomia aculeata* (Jacq.) Lodd. ex Mart.); Marí (*Poraqueiba sericea* Tul); Marajá (*Bactris acanthocarpa* Mart.); Mamão (*Carica papaya* L.); Lua - not identified; Japana branca (*Eupatorium ayapana* Vent.); Buchinha (cabacinha) (*Luffa operculata* (L.) Cogn.); Batata crioula (*Arracacia xanthorriza* Bancr.)	9	3.35	016
Urucum (*Bixa orellana* L.); Melhoral (*Justicia pectoralis* Jacq.); Maracujá do mato (maracujá de cheiro) (*Passiflora nitida* Kunth); Manga (*Mangifera indica* L.); Copaíba de planta - not identified; Cará branco (*Dioscorea dodecaneura* Vell.)	8	2.97	0.14
Sabugueiro (*Sambucus australis* Cham. & Schltdl.); Pitomba (*Talisia esculenta* (A.St.-Hil.) Radlk); Juru (*Chrysobalanus icaco* L.); Jucá (*Caesalpinia ferrea* var. *cearensis* Huber.); Gergelim preto (*Sesamum indicum* L.); Cravo de planta (*Tagetes minuta* L.); Comadre do azeite (mãe de azeite) (*Omphalea diandra* L.); Coco (*Cocos nucifera* L.); Barbatimão (*Stryphnodendron adstringens* (Mart.) Covile); Banana (bananeira) (*Musa paradisiaca*)	7	2.60	0.13
Vique pequeno (*Mentha arvensis* L.); Vique grande (*Mentha spicata* L.); Trevo roxo (panana) (*Scutellaria agrestis* A. St.-Hil. ex Benth.); Patauá (*Oenocarpus bataua* Mart.); Muruci (*Byrsonima crassifolia* (L.) Kunth); Maracujá de paca (*Passiflora micropetala* Mart. ex Mast.); Gergelim branco (*Sesamum orientale* L.); Cibalena (*Artemisia vulgaris* L.); Biribá (*Annona mucosa* Jacq.)	6	2.23	0.11
Vassourinha (*Scoparia dulcis* L.); Taxizeiro (*Tachigalia paniculata* Aublet); Pirarucu roxo (são raimundo) (*Bryophyllum pinnatum* (Lam.) Oken); Ouricuri (*Attalea phalerata* Mart. ex Spreng.); Onze-horas (*Portulaca grandiflora* L.); Mururé (*Pistia stratiotes* L.); Manjerona (*Origanum vulgare* L.); Jenipapo (*Genipa americana* L.); Esturaque (*Croton calycularis* Huber); Ceru (*Schinus terebinthifolia* Raddi); Capitiú (*Siparuna guianensis* L.); Caju açu (*Anacardium giganteum* L.); Ampicilina de planta (*Alternanthera tenella* Colla)	5	1.86	0.09
Peão pajé (*Jatropa molissima* L.); Marapuama (*Ptychopetalum uncinatum* Anselmino); Eucalipto (*Cymbopogon winterianus* Jowitt ex Bor); Comida de jabuti (*Peperomia pellucida* (L.) Kunth); Cará do ar (*Dioscorea bulbifera* L.); Buçu (*Manicaria saccifera* Gaertn.); Bacabi (*Oenocarpus mapora* Karsten); Alecrim (*Rosmarinus officinalis* L.)	4	1.49	0.07
Vinagreira (*Hibiscus sabdariffa* L.); Puruí (*Alibertia sorbilis* Ducke); Penicilina (*Gomphrena arborescens* L.f.); Pau mulato (*Calycophyllum spruceanum* (Benth.) K. Schum.); Palha preta (babaçu) (*Attalea speciosa* Mart. ex Spreng); Mututi (*Pterocarpus rohrii* Vahl); Japana roxa (*Eupatorium triplinerve* Vahl.); Ingá peludo (*Inga vulpina* Benth.); Ingá macaco (*Inga sessilis* (Vell.) Mart.); Fruta do conde (*Annona montana* Macfad.); Elixir paregórico (*Ocimum selloi* Benth.); Cumaru de planta - not identified; Cuia (*Crescentia cujete* L.); Carapanauba (*Aspidosperma nitidum* L.); Cabi (*Banisteria caapi* (Spruce ex Griseb.)); Buiuçú (*Ormosia coutinhoi* Ducke); Batata rainha (*Ipomoea batatas* (L.) var. Rainha); Achuá (chuá) (*Sacoglottis guyanensis* Benth.); Abiurana (*Pouteria pachycarpa* Pires); Abiu (*Pouteria caimito* (Ruiz & Pav.) Radlk.)	3	1.12	0.05
Tiririca (*Cyperus rotundus* L.); Quinarana (*Cinchona calisaya* Weed.); Pripioca (*Cyperus articulatus* L.); Pimenta malagueta (*Capsicum frutescens* L.); Pau doce (*Houvenia dulcis* Thunberg.); Pau chave (*Simarouba versicolor* A. St. -Hil.); Muru muru (*Astrocaryum murumuru* Mart.); Molongó (*Erythrina falcata* Benth.); Maracujá peroba (*Passiflora quadrangularis* L.); Macucu (oiti) (*Licania tomentosa* (Benth.) Fritsch); Maçaranduba (*Manilkara huberi* (Ducke) Stand.); Lima (*Citrus limettiodes* Tan); Larém (aralém) - not identified; Laranja da terra (*Citrus aurantium* L.); Lacre (*Vismia guianensis* (Aubl.) Pers.); Jacareúba (*Calophyllum brasiliense* Cambess.); Inajá (*Maximiliana maripa* L.); Faveira (*Vicia faba* L.); Cubiu (*Solanum sessiliflorum* Dunal); Cipó morceguinho (unha de morcego) (*Bignonia exoleta* Vell.); Cipó curimbó (*Tanaecium nocturnum* (Barb. Rodr.)); Carambola (*Averrhoa carambola* L.); Caju do mato (*Curatella americana* L.); Cachorro pelado (*Euphorbia tirucalli* L.); Brasileirinho (*Caladium bicolor* L.); Bolota - not identified; Batatão (*Ipomoea purga* (Wender.) Hayne); Bacuri azedo (*Garcinia madruno* (Kunth) Hammel); Bacuri açu (*Platonia grandiflora* Plach.); Assacu (*Hura crepitans* L.); Araticum (*Annona glabra* L.); Alfazema (*Hyptis suaveolens* (L.) Poit.)	2	0.74	0.04

The other species found in the present study were mentioned only once, with Fr and IVU, equal to 0.37 and 0.02, respectively.

Conclusions

The study showed that the residents of the Cajari River Extractive Reserve use 269 plant species as food and/or medicinal products, associated with high diversity and equitability. These data reveal the large knowledge about the use of plants in this unit, which constitute a real socio-cultural heritage of these populations. One of the assets observed in the present study, which differs from others found in this segment, is the interest of the young people in these plants, despite the observation that such interest is decreasing and with a tendency to focus on women and adults and the elderly. This shows the need to register and disseminate the diversity and ways of using these resources, at the risk of losing such knowledge over time. It was also possible to verify the strong relationship of dependence of these populations, since the habitat of most of the species found in the study is the native and riparian forests. Finally, in the last years, the pressure of use on these resources has increased due to the rise in the population, the execution of gardens and fires, which urgently requires the protection, conservation and propagation of many species. These are directly related to the families' survival strategies, and for many of these species, there is still no agronomic protocol that makes it possible to replant them.

Declarations

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Authors' contributions

GXPF and RHSS planned and coordinated the study; GXPF, AFR, AFM and WFP performed the fieldwork; GXPF, WLB and RHSS analyzed the data, discussed the results, wrote and reviewed the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The authors already included all data in the manuscript collected during the field surveys. The documented plant species were deposited at Herbarium Collection of Amapá State (HAMAB), Macapá, Amapá, Brazil.

Ethics approval and consent to participate

During field work, prior consent of the informants was taken conductingthese studies. This was done to adhere to the ethical standards ofcommunity participation in scientific research.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Figures
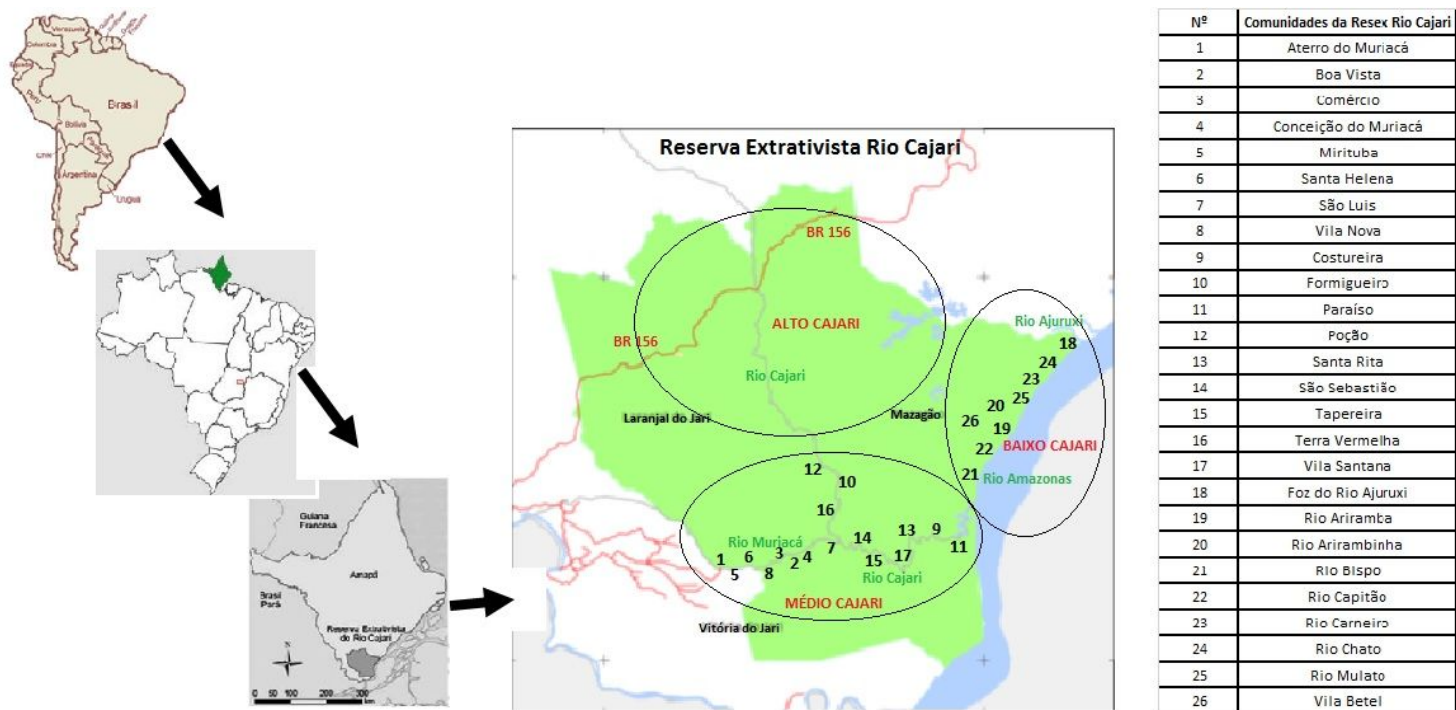
Figure 1

Study area site, Cajari River Extractive Reserve. Municipalities of Mazagão, Laranjal do Jari and Vitória do Jari, State of Amapá, Brazil.