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Etnobotânica Quilombola: um estudo de caso em uma comunidade de descendentes de escravos do centro do bioma Cerrado

Quilombola ethnobotany: a case study in a community of slave descendants from the center of the Cerrado biome

Etnobotánica Quilombola: un estudio de caso en una comunidad de descendientes de esclavos del centro del bioma Cerrado

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Resumo

As atuais comunidades quilombolas são remanescentes das aldeias escravas brasileiras. A comunidade de Cedro, município de Mineiros – GO, utiliza recursos botânicos do bioma Cerrado para compor remédios à base de ervas, que constituem uma importante fonte de renda para os moradores. O objetivo deste trabalho foi avaliar essa tradição escrava considerando i. o padrão de uso da planta; ii. a relação entre origem e riqueza taxonômica composta; e iii. o consenso sobre o uso de plantas X ações farmacológicas propostas na medicina local. Os dados foram obtidos utilizando técnicas gratuitas de listagem e bola de neve, entrevistas semiestruturadas e visitas guiadas. Os resultados indicaram que a comunidade apresenta um amplo padrão de uso das espécies; em 380 etno-referências, 166 espécies foram citadas. As famílias Fabaceae, Asteraceae e Lamiaceae foram mais ricas em espécies e etno-referências; a maioria das plantas citadas são nativas, coletadas em quintais ou em um Cerrado típico. Infusão e decocção foram os métodos de preparação mais diversos (H' = 2.6201) e foram utilizados principalmente para tratar doenças do sistema digestivo e metabólico. As espécies com maior valor de uso (UV) foram *Cymbopogon citratus*, *Citrus limon*, *Hymenaea courbaril*, *Dysphania ambrosioides* e *Baccharis trimera* (UV> 1). Este trabalho constitui uma importante pesquisa sobre o conhecimento etnobotânico de descendentes de escravos e demonstra a importância dos recursos do bioma Cerrado para fitoterapias em comunidades quilombolas que se desenvolveram no centro desse bioma.

Palavras-chave: Comunidade tradicional; Diversidade; Fitoterapia; Plantas medicinais; Quilombo.

Abstract

Current Quilombola communities are remnants of Brazilian slave communities. The community of Cedro, municipality of Mineiros – GO, uses botanical resources from the Cerrado biome to compose herb-based remedies, that constitute an important source of income for residents. The aim of this work was to evaluate this slave tradition considering i. the pattern of plant use; ii. the relationship between origin and compound taxonomic richness; and iii. the consensus on plant use X pharmacological actions proposed in local medicine.

Data were obtained using free listing and snowball techniques, semistructured interviews and guided tours. The results indicated that the community presents a wide pattern of species use; in 380 ethno-references, 166 species were mentioned. The families Fabaceae, Asteraceae and Lamiaceae were richer in species and ethno-references; most of the plants are native and were collected in backyards or a typical Cerrado. Infused and decocted teas were the most diverse preparation methods (H' = 2.6201), and they were primarily used to address diseases of the digestive and metabolic system. The species with higher use values (UV) were *Cymbopogon citratus*, *Citrus limon*, *Hymenaea courbaril*, *Dysphania ambrosioides* and *Baccharis trimera* (UV>1). This work constitutes an important survey about the ethnobotanical knowledge of descendants of slaves and demonstrates the importance of the resources of the Cerrado biome for therapy in Quilombola communities that developed in the center of this biome.

Keywords: Diversity; Medicinal plants; Phytotherapy; Quilombo; Traditional community.

Resumen

Las comunidades actuales de quilombolas son restos de aldeas esclavistas brasileñas. La comunidad Cedro, ubicada en el municipio de Mineiros – GO, utiliza recursos botánicos del bioma Cerrado para componer remedios herbales, que son una fuente importante de ingresos para los residentes. El objetivo de este trabajo fue evaluar esta tradición esclava considerando i. el patrón de uso de la planta; ii) la relación entre origen y riqueza taxonómica compuesta; y iii. El consenso sobre el uso de plantas versus acciones farmacológicas propuestas en la medicina local. Los datos se obtuvieron mediante listas gratuitas y técnicas de bola de nieve, entrevistas semiestructuradas y visitas guiadas. Los resultados indicaron que la comunidad tiene un amplio patrón de uso de las especies; en 380 etno-referencias, se citaron 166 especies. Las familias Fabaceae, Asteraceae y Lamiaceae eran más ricas en especies y etno-referencias; La mayoría de las plantas mencionadas son nativas, recolectadas en patios o en un Cerrado típico. La infusión y la decocción fueron los métodos de preparación más diversos (H' = 2.6201) y se utilizaron principalmente para tratar enfermedades del sistema digestivo y metabólico. Las especies con mayor valor de uso (UV) fueron *Cymbopogon citratus*, *Citrus limon*, *Hymenaea courbaril*, *Dysphania ambrosioides* y *Baccharis trimera* (UV> 1). Este trabajo constituye una investigación importante sobre el conocimiento etnobotánico de los descendientes de esclavos y demuestra la importancia de los recursos del bioma Cerrado para las fitoterapias en las comunidades quilombolas que se desarrollaron en el centro de este bioma.

Palabras clave: Comunidad tradicional; Diversidade; Fitoterapia; Plantas medicinales; Quilombo.

1. Introduction

Brazil is rich in biodiversity, and its traditional uses of medicinal plants are primarily based on Amerindian culture, although many processes started only after the arrival of the Portuguese in 1500 and the first African slaves in 1539. However, successive economic cycles not only affected native vegetation but also led to intense cultural erosion. As a result, information on the use of plants during past centuries is scattered and has not been interpreted (Ricardo et al. 2018). Recently developed ethnobotanical research in the Cerrado has contributed to the recovery of some of this lost information, improving the description and documentation of the biodiversity of plants used for medicinal purposes in rural, indigenous or Quilombola communities. For example, Cavalheiro and Guarim (2018) cataloged 72 species (39 families) in the community of Aldeia Velha - MT, 80% of which had medicinal applications, while Ribeiro et al. (2017) reported 309 ethnobotanical species for communities in Alto Araguaia - MT, which were distributed over 86 families. Souza et al. (2016) reported 112 ethnospecies that were referenced by healers in the city of Jataí-GO, while Almeida (2016) documented 60 species of plants used for medicinal purposes among traditional Quilombola communities in northeastern Goiás.

Brazilian Quilombola communities (Afro-descendants) are remnants of quilombo communities, groups of slaves formed by freed or fugitive slaves, who constituted a movement to resist slavery. Quilombola communities maintain traditions ethnically based on African culture and despite the intense occupation of the Cerrado, which has been accelerated by agribusiness and livestock, these communities still remain in the remnant vegetation (Almeida, 2016) and engage in their cultural practices, including phytotherapeutics, which have spread rapidly due to their low cost and easy access by the population to native and naturalized flora (Griz et al., 2017).

These communities have unique characteristics that originate from a long history of isolation (Fernandes, 2018). Studies indicate the vulnerability of health conditions among Quilombola populations due to difficulties in accessing goods and services (Cardoso et al., 2018), which are probably pressing factors that have led to the use of local flora to solve health problems. Therapy in these communities involves the combination of healing rituals and the prescription of plants.

In the state of Goiás, these communities are composed of populations with low incomes, a low level of schooling, and a lack of basic sanitation, and some employ home self-medication and allopathic medication, while others, such as the Kalunga population, derive their diversity of drugs primarily from plants native to the Cerrado (Almeida, 2016). In general, the dependence of these communities on the resources offered by the Cerrado, especially plants, is high. Therefore, recording the knowledge and the relationship that these populations have with medicinal plants constitutes a strategy for the conservation of plant resources and cultural identities.

The objective of this work was to know the plants, as well as aspects of their medicinal use by descendants of slaves. For this we chose to carry out our study at the Quilombola community of Cedro, which has a community plant center (Centro Comunitário de Plantas Medicinais; CCPM) where medicines are compounded and marketed. Many families in the community are financially dependent on this activity. However, as Quilombola communities face many infrastructure problems: absence of roads, medical assistance and schools, they live with drought, some are below the poverty line and others below the indigence line, it is urgent to document the ethnobotanical knowledge of that community. Thus, this work analyzed plants and collection sites used by residents of the community, under an ethnobotanical approach, with a view to the taxonomic determination of ethno-referenced plant diversity; ecological characteristics; usage patterns; use value and pharmacological actions of the referenced plants.

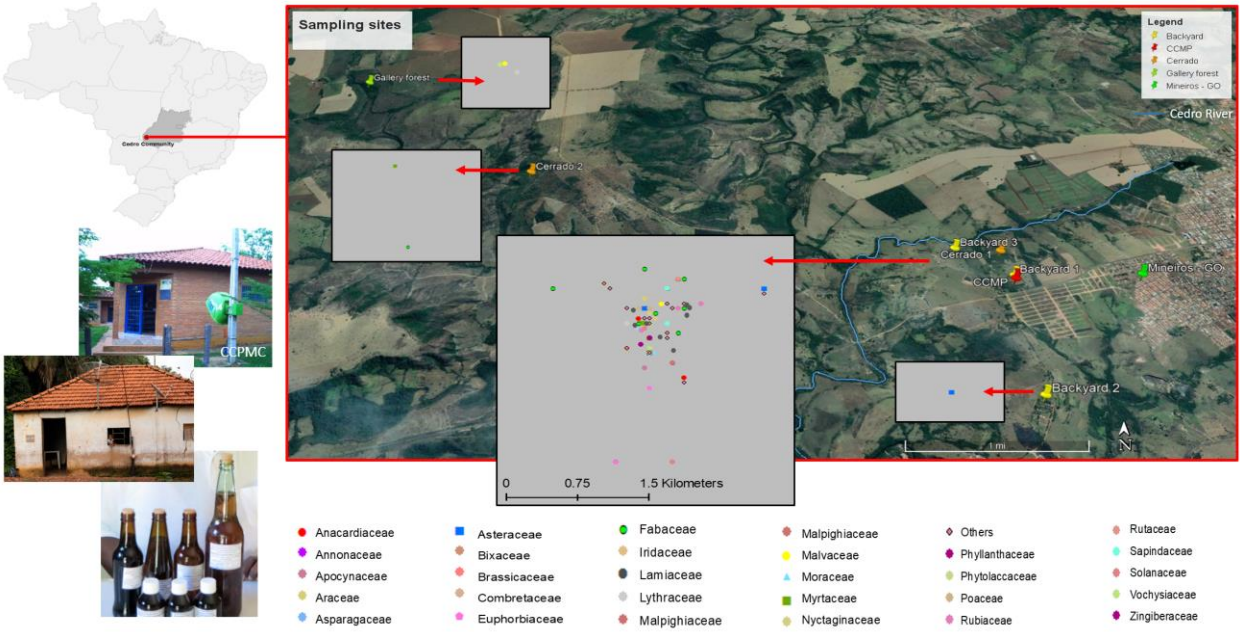
2. Methodology

Physiographic and historical aspects of the study area

The Quilombola community of Cedro (QCC) is located in the Central Plateau of Brazil, municipality of Mineiros - GO, in the southwestern microregion of Goiás state at the coordinates 17°34'10"S and 52°33'04"W, and it has an average elevation of 760 meters. The collection environments were mapped using the geographic information system available in ArcGIS 10.1 software and Google Earth (www.earth.google.com) (Fig. 1). The climate of the region is predominantly tropical, with a dry winter, temperatures ranging between 15°C and 27°C and an average annual cumulative rainfall of 1,700 mm. The region is located within the high basin of the Araguaia river and is supplied by the Paranaíba and Araguaia Rivers, the tributaries of which are the Babilônia, Diamantino, Verde, Formoso and Jacuba Rivers.

Several vegetative formations are found in the region, constituting fragments of grasslands, savannas and forests.

Figure 1. Quilombola do Cedro Community in Mineiros - GO, Brazil. Sampling environments used by the community to obtain plants used in the manufacture of herbal medicines. The gray squares show sampling points for plants from the different families used. Unmarked points on the map occur overlapping other points marked in the table corresponding to Cerrado1, Yard 1 and Yard 3. CCMP - Cedro Medicinal Community Cente.



Source: Authors.

The Quilombola community of the Cedro was created in 1895 by the slave Francisco Antônio de Moraes, who was known as Chico Moleque. Following manumission, he acquired a part of the Flores do Rio Verde Farm. The Centro Comunitário de Plantas Medicinais do Cedro (Community Center of Medicinal Plants of Cedro; CCPMC) was conceived by the Quilombolas, who already used medicinal plants to cure diseases. They built the center with funds from the Institute for Society, Population and Nature, or ISPN, and inaugurated it in November of 1998.

Legal and ethical aspects

This project was presented to the community and discussed, and those who agreed to participate signed the Informed Consent Form. After this process, the project was approved by the Human Research Ethics Committee at the Instituto Federal de Educação, Ciência e Tecnologia Goiano (Goiano Federal Institute of Education, Science and Technology; IF Goiano), registered under opinion no. CAAE: 44049015.8.0000.0036 and enrolled in CEGEN/MMA under registration ACE3BFF.

Ethnobotanical data collection

The collection of ethnobotanical data lasted for 13 months and was performed from 2015 to 2017, with weekly incursions lasting 8 hours in the study area. The following four research techniques were used: 1. Free listing (Albuquerque et al., 2014; Lozano et al., 2014) based on the list of common names (ethnospecies) spelled out in the collection of medicinal plants notebook at the CCPMC. 2. The snowball technique, in which people from Cedro identified the members of the community who hold traditional knowledge about the medicinal plants used in the community pharmacopoeia, who are considered as ethnoguides here. Residents identified 16 ethoguides. 3. Semi-structured interviews, (with the 16 ethnoguides) in which a plant was submitted to the ethnoguide, who specified the used part (UP), the use route (U), the method of preparation (PREP) and the disease or symptom for which the plant is used (D). 4. Guided tours conducted with the16 ethnoguides that guided the researchers to collect ethnospecies (ES) during excursions in backyards and native areas maintained on the Quilombola properties.

Samples of the collected ES were processed according to the usual procedures and recorded in the Herbarium at IFGoiano Campus Rio Verde (HRV) and in the Jataiense Herbarium (JH). At the time of collection, each *in vivo* plant was imaged, and the environment (En) and habit (H) were recorded; afterwards, the samples or images were sent to specialists who determined the flora and taxa according to the APG IV. The scientific names and origin (O) were checked in the Flora of Brazil (http://floradobrasil.jbrj.gov.br) and Trópicos (http://www.tropicos.org/) databases.

To standardize the results and bring traditional and academic knowledge closer, a comparison was made between the diseases by referring to each target organ and the

International Classification of Functioning, Disability and Health, which resulted in a list of therapeutic indications (TI).

Data analysis

The species richness data of the ethno-references were analyzed quantitatively using a descriptive analysis. To analyze the diversity of the species, the drug preparation method was performed according to the medicinal plant use specified by the Cedro people, and the species diversity (SD) was determined by adapting the Shannon-Weaver diversity index (*H'*) as follows:

$$H' = -\sum_{i=1}^{S} p_i \ln p_i$$

where *S* is the species richness, *pi* is the relative abundance of the use of each species, and the index is calculated by finding the number of times the species was cited for some type of preparation divided by the total number of species citations.

The use of the species (UV) value refers to the total number of uses referenced for each ethnospecies (Souza et al., 2016) and is determined using the equation UV=∑(U/n), where *U* is the number of times a species is cited and *n* is the number of informants indicating the species. This quantitative method evaluates the consensus use for each medicinal species based on the importance attributed by the informants regardless of the researcher's opinion.

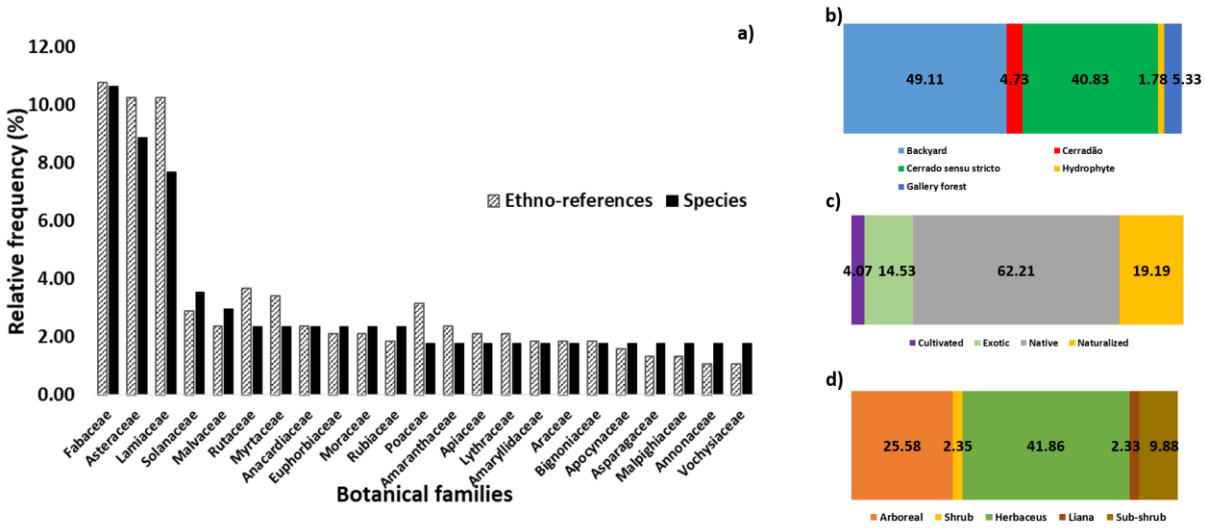
3. Results and Discussion

Field incursions allowed for the mapping of the six collection environments used by the ethnoguides to obtain the specimens, and they were performed in 03 backyards, 02 areas of Cerrado *stricto sensu* and 01 gallery forest (Fig.1). The plants obtained from aquatic environments were collected from a portion of the Cedro River. The Cerrado 01 area was the area used the most by the Quilombolas to obtain the plant specimens used to manufacture compounded medicines. This area was used often because it is very close to the backyards, which in turn are very close to the community center for medicinal plants of Cedro.

The methodology used here allowed for the creation of 380 ethno-references for 166 medicinal species distributed over 151 genera and 67 families, fifteen of which represented

approximately 60% of the species and ethno-references (TableS1). The families Fabaceae, Asteraceae and Lamiaceae stood out, representing 30% of the data cited, and most species sampled (Fig. 2a and Fig.1). In this way, the most ethnoreferenced families are also the families that contribute with the greatest number of species, in the total set of species used by the community in the manufacture of herbal medicines.

Figure 2. Relative frequency of ethnoreferenced botanical families and species used by the Quilombola do Cedro Community in the manufacture of herbal medicines (a) and Absolute frequency (%) of species, regarding the collection environment (b), origin (c) and species habit (d).

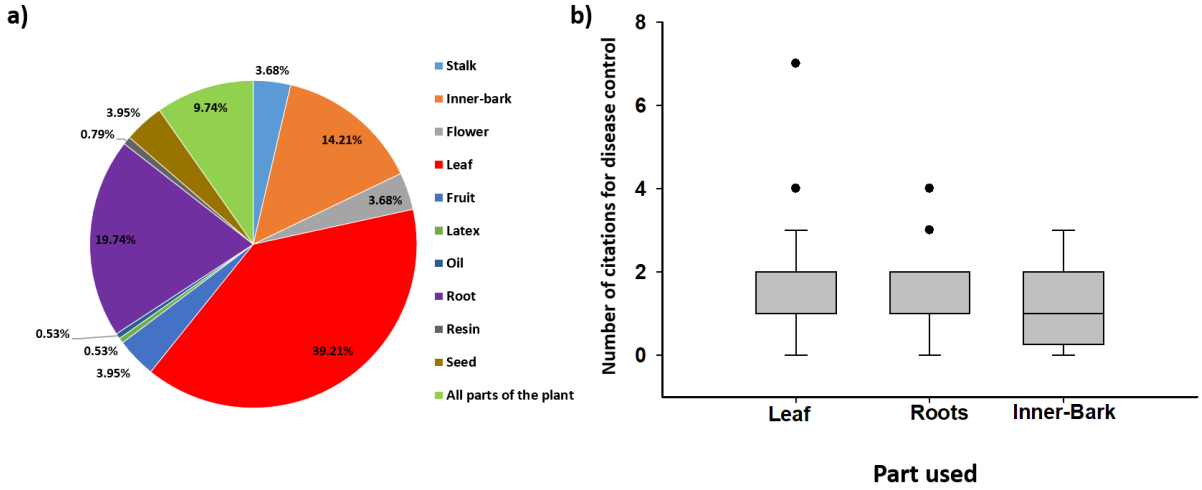


Source: Authors.

Considering the origin, habit and environment of this collection of medicinal plants, most of the species are native (62.21%) and herbaceous (42.6%) and were collected in backyards (49.11%) or in remnants of the typical Cerrado (40.83%), as observed in Fig. 2b, c e d.

The Cedro people use multiple parts of the plant, as observed in Fig. 3a, but the leaves stood out at 39%, followed by the roots and inner stem bark, which together totaled more than 70% of the ethno-references. Internal use was more prevalent (84%) than external use (16%).

Figure 3. Vegetable parts used by the Quilombola do Cedro Community in the manufacture of herbal medicines. (a) Relative frequency (%) of the use of the different plant parts; b) Number of citations for the control of different diseases of the three plant parts most used medicinally by the community.



Source: Authors.

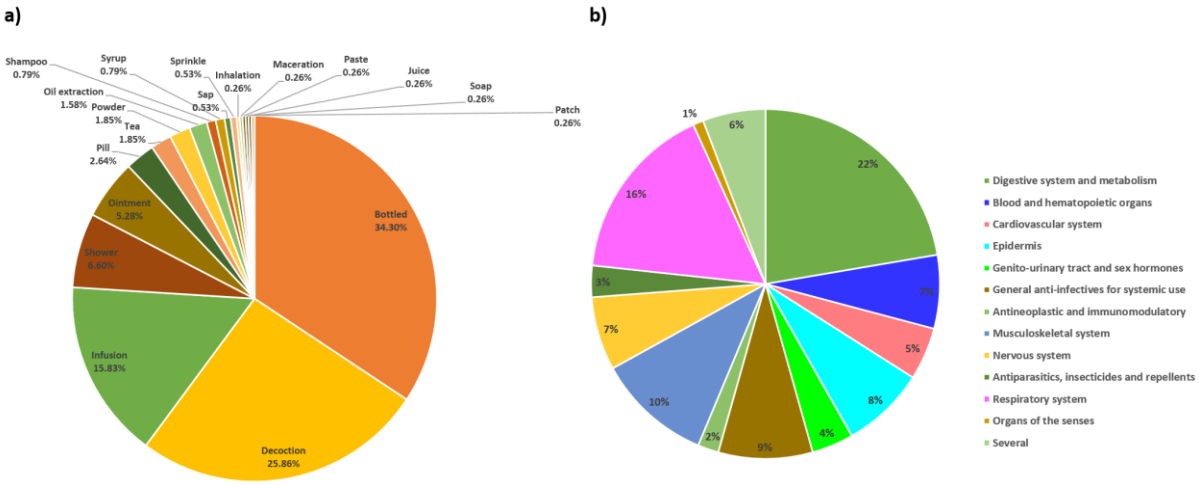
Leaves, roots or bark of 169 ethno-referenced species are used medicinally. Analyzing these parts separately according to the number of citations for disease control, there was a homogeneity between the indications of these categories, with a variation of 0 to 3 citations in each class (Fig. 3b). For leaf, 81 species from 42 botanical families were listed that are used to fight different diseases, with emphasis on eucalyptus (*Eucalyptus globulus* Labill., Myrtaceae), mentioned 7 times and for boldo (*Plectranthus barbatus* Andr., Lamiaceae), mentioned 4 times (see outliers).

For root, the use of 52 species from 35 botanical families was verified, with three species escaping the citation standard for the control of different diseases. These species were the unha-de-boi (*Bauhinia pentandra* Bong. D., Fabaceae, the açafrão (*Curcuma longa* L., Zingiberaceae) and the inhame (*Colocasia esculenta* L. Schott, Araceae), with 4, 3 and 3 citations, respectively (see outliers Fig. 3b). For the stem bark, 27 species from 16 botanical families were mentioned, with 3 being the maximum number of citations presented by the species.

Regarding the way of preparing the medications, a higher prevalence of bottles was observed (34.30%), followed by decoction (25.86%), infusion (15.83%), shower (6.60%), ointment (5.28%), pill (2.64%), tea and powder (1.85%) and oil extraction (1.58%). The other

methods of preparation mentioned corresponded to less than 1% of the total citations (Fig. 4a).

Figure 4. Relative frequency of the methods of preparation used by the Quilombola do Cedro Community in the manufacture of herbal medicines (a) and therapeutic indications, according to the anatomical therapeutic chemical classification system (ATC) (b).



Source: Authors.

The plants were related to 96 symptoms or diseases listed by the community that comprised 13 therapeutic activities in human body systems (Body Therapy Activity, BTA). The highest number of citations was for digestive and metabolism (22%), respiratory system (16%), musculoskeletal system (10%), general anti-infectives for systemic use (9%), dermatological drugs (9%) , blood and hematopoietic organs (7%), and other body systems (less than 7% each) (Fig. 4b).

Most of the sampled species (65) were cited twice for some medicinal uses, 49 species were cited once, 42 were cited three times and only 09 were cited four times. However, the highest number of citation indexes (above 04) occurred for only one species: capim-santo (*Cymbopogon citratus* DC. Stapf), with 09 citations; lemon (*Citrus limon* L. Osbeck), with 08 citations; eucalyptus (*Eucalyptus globulus* Labill.), with 07 citations; jatobá-da-mata (*Hymenaea courbaril* L.), with 06 citations end erva-de-santa-maria (*Dysphania ambrosioides* L. Mosyakin & Clemants), with 05 citations; that is, few species were cited many times, and many species were rarely cited.

The ethnospecies that presented the greatest versatility of indications in relation to BTA are observed in Tab. 1, with emphasis on unha de boi, mint, transagem, salvia and myrrh, which are useful for four treatment activities.

According to the Shannon-Weaver diversity index, *H'* = 5.0002 was observed for the medicinal plants used by the community. When this index was compared according to the different preparation methods, the highest plant diversity was observed for the tea preparation (*H'* = 2.6201), followed by the bottled (*H'* = 2.1764), decoction (*H'* = 1.5998), bath (*H'* = 0.4565) and ointment (*H'* = 0.3459) preparations (Fig. 5a). Most of the sampled species (65) were mentioned twice for some medical use (Fig. 5b), 49 species were mentioned once, 42 were mentioned three times and only 09, four times. But the highest citation rates (above 4) occurred for only one species, that is, few species were cited a lot.

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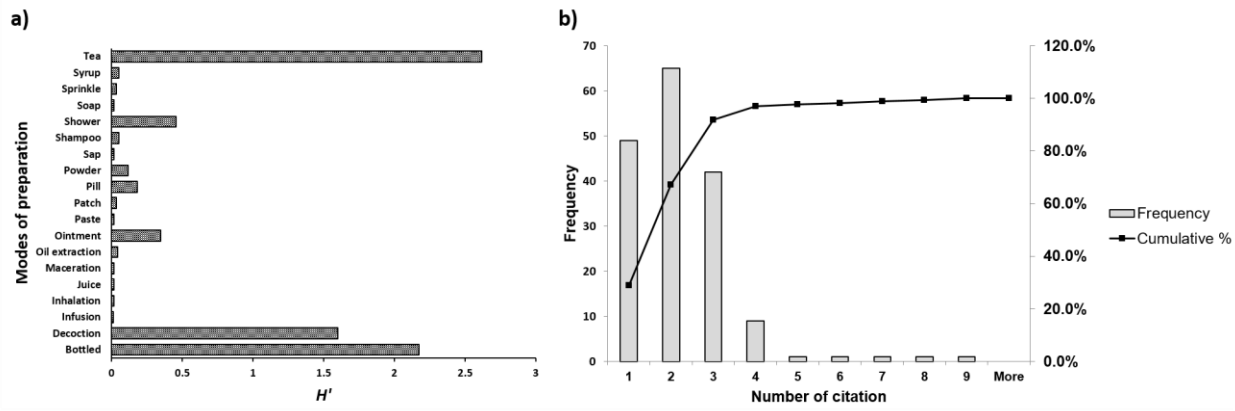
Figure 5. Shannon-Weaver diversity index (*H'*) adapted to express the diversity of ethno-referenced plants for the different preparation methods used by the Quilombola do Cedro Community in the manufacture of herbal medicines (a). Relative and cumulative frequency of the number of citations for indications of ethnoreferenced medicinal plants.



Source: Authors.

Regarding informant consensus, it was verified that 79 species (46.75%) have only one indication (UV = 0.2638), and more than one use in disease control was attributed to the rest of the species.

The capim-santo species (*Cymbopogon citratus*) was subject to the highest consensus among the informants (UV = 2.3746). It is used to combat fever, coryza, pulmonary infection, diabetes, bronchitis, tuberculosis and asthma. The other species with the highest consensus were lemon (*Citrus limon*) with UV = 2.1108, followed by eucalyptus (*Eucalyptus globulus*) with UV = 1.8469, jatobá-da-mata (*Hymenaea courbaril*) with UV = 1.5831, erva-de-santa-maria (*Dysphania ambrosioides*) with UV = 1.3192, and carqueja (*Baccharis trimera* Less. DC.) with UV = 1.0554.

For balm (*Cotyledon orbiculata* L.), mint (*Mentha spicata* L.), transagem (*Plantago major* L.), boldo (*Plectranthus barbatus* Andr.) and salvia (*Salvia officinalis* L.), UV = 1.0554 was observed.

The Fabaceae, Asteraceae and Lamiaceae families stand out as the most diverse families with regards to the species and ethno-references. Other studies have already demonstrated the importance of these plant families in the composition of the phytotherapeutic flora used by other communities in the Cerrado (Souza et al., 2016; Ribeiro et al., 2017). These results can be explained by the natural tendency of larger families, in

terms of already identified species, to have a greater number of species assigned some use the human populations. Fabaceae is the family with the largest number of species in the entire Cerrado. However, Asteraceae is the largest family of angiosperms, and it is recognized as important in the formation of the herbaceous and shrub stratum of the Cerrado (Gottsberger & Silberbauer-Gottsberger, 2018). The importance of this family for use in obtaining compounded medicines has already been shown (Rahman, 2013).

The Lamiaceae family, which is known as the primary family of herbs, is highly representative because most of its species produce secondary metabolites with proven phytotherapeutic action. These actions correspond to antioxidant properties due to the high polyphenol content, along with analgesic properties (Uritu et al., 2018), antimicrobial properties with the potential to combat multiresistant bacteria (Assis et al., 2018) and anti-inflammatory properties (Liu et al., 2018).

Residents of the Cedro community obtain their medicinal plants primarily from their own backyards. They do so because many of the ethno-referenced plants in this community are exotic. Most of the plants found in backyards are exotic in nature because people living near native forest or mixed-use areas tend to have fewer native plants in their backyards since they are available nearby (Kujawska et al., 2018).

Some native plants, such as *Bixa orellana* L., *Commelina erecta* L., *Brosimum gaudichaudii* Trécul., *Plinia cauliflora* (Mart.) Kausel and *Senna occidentalis* (L.) Link, are compounded in the backyards of the Cedro people. This approach can be explained by the distance of this community from urban areas. Poot-Pool et al. (2015) argue that the richness of useful species of trees and shrubs, especially native ones, tends to be greater in medicinal gardens that are more distant from urban centers, and in urban areas, the number of herbaceous species increases, especially the introduced ornamental species. Our study supports the hypothesis that home gardens can act as a springboard for plant domestication because a large proportion of native plants are transported and grown in domestic gardens (Peroni et al., 2016).

The care and maintenance of native medicinal plant species occur in home gardens because some of these plants are no longer found easily in fragments of remnant vegetation, reducing the need for the community to seek them in places far from their dwellings. Notably, the use of exotic medicinal plants is associated with knowledge from the ancestors of the community, such as Africans, who brought knowledge from another continent. It is true that the Quilombola population carries the culture practiced by its ancestors in diverse ways,

including dances, religious rituals and plants, which have been used for diverse purposes in the past.

Many studies have emphasized the importance of native flora in the composition of the communities' referential ethnobotanical knowledge (Souza et al., 2016; Ribeiro et al., 2017). This shows the strong influence of the landscape on the accumulation of traditional knowledge about the use of native flora.

The leaf is the plant part most frequently used by the community for making compound medicines. The leaves are more easily collected and sampled throughout the year, which facilitates and popularizes their use. Similar observations were found by Oliveira et al. (2010) when evaluating the medicinal plants used in the city of Rosário da Limeira - MG, where the leaves corresponded to 67.69% of the plant parts in use. Similarly, in a study in Imperatriz - MA, Penido et al. (2016) observed that the leaves comprised 63.3% of the parts in use. Souza et al. (2016) emphasized the importance not only of the leaves but also of the roots for the manufacture of compound remedies, as these remedies often concentrate large portions of the bioactive materials.

Teas are the preparations most frequently used by residents of the Cedro community. Alves et al. (2016) found similar results, but in reverse order, in an ethnobotanical study performed in the municipality of Guarabira - PB, where decocts, followed by bottled treatments, accounted for most of the samples. The diversity index (*H'*) showed that the inhabitants of the Cedro community use a wide variety of plants for making medicines, and the greatest diversity was found in the tea preparation method. Many studies have documented the pharmacological properties of teas and have encouraged their consumption (Saeed et al., 2017), spreading this cultural practice from East Asia to the West. The ease of preparation makes this form of use very widespread among traditional communities.

Cymbopogon citratus was the ethno-referenced species in the Cedro community that presented the highest value in terms of use. This exotic species is native to Southeast Asia. Studies have shown hypoglycemic, hypolipidemic, anxiolytic, sedative, antioxidant and anti-inflammatory effects for this species (Campos et al., 2014). Recently, researchers have demonstrated that the essential oil of this plant significantly decreases the survival of cancer cells *in vitro* (Bayala et al., 2018). The native species that presented the highest UV was *Hymenaea courbaril*, and its prevalence in relation to its use and indications can also be observed in Boniface et al. (2017). This plant is commonly ethno-referenced in ethnobotany studies from Brazil (Pio et al., 2018). The most commonly used part of this plant is the stem bark, which is used in the preparation of cachaças (sugarcane brandies), teas, infusions, resins

and wines (Silva & Nascimento 2018). The use of the bark is due to the presence of an essential oil with proven antimicrobial activity and the ability to modulate antibiotic activity (Sales et al., 2015).

With respect to the pharmacological actions of the ethno-references, it was verified that the greatest number of pharmacological actions was attributed to the botanical families Fabaceae, Lamiaceae and Asteraceae, and the antibiotic, anti-inflammatory and analgesic actions stood out. According to Ribeiro et al. (2018), these families are the most frequently cited in studies of medicinal plants.

In general, ethnobotany has been important for documenting some uses, which can be supported by scientific studies over time. However, there is still much room for contributing data on the pharmacological properties of plants. For some communities, such as the Quilombola community of Cedro, the CCPMC is not only a place to disseminate popular knowledge but also a source of income for the community, which allows the commercialization of manipulated drugs. This study represents an important step in documenting and preserving the traditional knowledge of Quilombola communities in the Cerrado, documenting the identification and prevalence of the use of several plant species. It is hoped that the results obtained in this work may help to strengthen the traditional medicine of the Cerrado peoples, contributing to the preservation not only of the culture but also of the natural resources used by these communities.

4. Final Considerations

This work cataloged 379 ethno-references about the medicinal use of plants of naturalized and mainly native to the Cerrado biome by the Quilombola community of Cedro. This work demonstrates the importance of the resources of the Cerrado biome for therapy in communities descended from slaves that developed in the center of this biome. This study showed and identified 166 medicinal plants used by the community in the production of compound medicines destined for the CCPMC. This number expresses not only the richness of the references maintained as knowledge but also the richness of species kept in the backyards of members of this community.

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References

Albuquerque, U. P., Ramos, M. A., de Lucena, R. F. P., Alencar, N. L. (2014). *Methods and techniques used to collect ethnobiological data*. In: Albuquerque, U. P.; Cunha L. V. F. C.; de Lucena R. F. P.; Alves, R. R. N. S. (eds.) Methods and techniques in ethnobiology and ethnoecology. New York, NY, Springer. p. 15-37.

Almeida, M. G. D. (2016). Traditional Quilombola communities in Northeastern Goias: backyards as territorial expressions. *Confins-Revue Franco-Brasilienne de Geographie 29*.

Alves, C. A. B., da Silva S., da Belarmino, N. A. L. A., Souza, R. S., da Silva, D. R., Alves, P. R. R., Nunes, G. M. (2016). Comercialização de plantas medicinais: um estudo etnobotânico na feira livre do município de Guarabira, Paraíba, Nordeste do Brasil. *Gaia Scientia*, *10* (4), 4-31.

Assis, F. V. D., Siqueira, F. L., Gonçalves, I. E., Lacerda, R. P., Nascimento, R. A., Araújo, S. G., Andrade, J. T., Herrera, K. M. S., Ferreira, L. A. R. S. (2018). Antibacterial activity of Lamiaceae plant extracts in clinical isolates of multidrug-resistant bacteria. *Anais da Academia Brasileira de Ciências*, *90* (2), 1665-1670. doi: 10.1590/0001-3765201820160870.

Bayala, B., Bassole, I. H. N., Maqdasy, S., Baron, S., Simpore, J., Lobaccaro, J. A. (2018). *Cymbopogon citratus* and *cymbopogon giganteus* essential oils have cytotoxic effects on tumor cell cultures. Identification of citral as a new putative anti-proliferative molecule. *Biochimie*, *153*, 162-170. doi: 10.1016/j.biochi.2018.02.013.

Boniface, P. K., Ferreira, S. B., Kaiser, C. R. (2017). Current state of knowledge on the traditional uses, phytochemistry, and pharmacology of the genus *Hymenaea*. *Journal of Ethnopharmacology*, *206*, 193-223. doi: 10.1016/j.jep.2017.05.024.

Campos, J., Schmeda-Hirschmann, G., Leiva, E., Guzmán, L., Orrego, R., Fernandez, P., González, M., Radojkovic, C., Zuñiga, F. A., Lamperti, L., Pastene, E., Aguayo, C. (2014). Lemon grass (*Cymbopogon citratus* (d.C) stapf) polyphenols protect human umbilical vein endothelial cell (huvecs) from oxidative damage induced by high glucose, hydrogen peroxide and oxidised low-density lipoprotein. *Food Chemistry*, *151*, 175-181. doi: 10.1016/j.foodchem.2013.11.018.

Cardoso, C. S., de Melo, L. O., Freitas, D. A. (2018). Health conditions in quilombola communities. *Journal of Nursing UFPE on line*, *12* (4), 1037-1045. doi: 10.5205/1981-8963-v12i4a110258p1037-1045-2018.

Cavalheiro, L., Guarim, G. (2018). Ethnobotany and regional knowledge: combining popular knowledge with the biotechnological potential of plants in the Aldeia Velha community, chapada dos guimarães, Mato Grosso, Brazil. *Boletín Latinoamericano y del Caribe de Plantas Medicinales y Aromáticas*, *17* (2), 197-216.

Fernandes, M. L. B. (2018). Os conceitos de vivência e reelaboração criadora para as crianças de uma comumidade quilombola. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud*, *16* (1), 213-226. doi: 10.11600/1692715x.16112.

Gottsberger, G., Silberbauer-Gottsberger, I. (2018). How are pollination and seed dispersal modes in Cerrado related to stratification? Trends in a Cerrado sensu stricto woodland in Southeastern Brazil, and a comparison with neotropical forests. *Acta Botanica Brasilica*, *32* (3), 434-445. doi: 10.1590/0102-33062018abb0186.

Griz, S. A. S., Matos-Rocha, T. J., Santos, A. F., Costa, J. G., Mousinho, K. C. (2017). Medicinal plants profile used by the 3rd district population of Maceió-AL. *Brazilian Journal of Biology*, *77* (4), 794-802. doi: 10.1590/1519-6984.01116.

Kujawska, M., Zamudio, F., Montti, L., Carrillo, V. P. (2018). Effects of landscape structure on medicinal plant richness in home gardens: evidence for the environmental scarcity compensation hypothesis. *Economic Botany*, *72*, 150-165. doi: 10.1007/s12231-018-9417-3.

Liu, H., Ma, S., Xia, H., Lou, H., Zhu, F., Sun, L. (2018). Anti-inflammatory activities and potential mechanisms of phenolic acids isolated from *Salvia miltiorrhiza* f. Alba roots in THP-1 macrophages. *Journal of Ethnopharmacology*, *222*, 201-207. doi: 10.1016/j.jep.2018.05.008.

Lozano, A., Araújo, E., Medeiros, M., Albuquerque, U. (2014). The apparency hypothesis applied to a local pharmacopoeia in the Brazilian Northeast. *Journal of Ethnobiology and Ethnomedicine*, *10*, 2. doi: 10.1186/1746-4269-10-2.

Oliveira, H. B. D., Kffuri, C. W., Casali, V. W. D. (2010). Ethnopharmacological study of medicinal plants used in Rosário da Limeira, Minas Gerais, Brazil. *Revista Brasileira de Farmacognosia*, *20* (2), 256-260. doi: 10.1590/S0102-695X2010000200020.

Penido, A. B., Morais, S. M. D., Ribeiro, A. B., Silva, A. Z. (2016). Ethnobotanical study of medicinal plants in Imperatriz, State of Maranhão, Northeastern Brazil. *Acta Amazonica*, *46* (4), 345-354. doi: 10.1590/1809-4392201600584.

Peroni, N.; Hanazaki, N.; Begossi, A.; Zuchiwschi, E.; Lacerda, V. D.; Miranda, T. M. (2016). Homegardens in a micro-regional scale: contributions to agrobiodiversity conservation in an urban-rural context. *Ethnobiology and Conservation*, *5*, 1-17. doi: 10.15451/ec2016-8-5.6-1-17.

Pio, I. D. S. L.; Lavor, A. L.; Damasceno, C. M. D.; Menezes, P. M. N.; Silva, F. S.; Maia, G. L. A. (2018). Traditional knowledge and uses of medicinal plants by the inhabitants of the Islands of the São Francisco river, Brazil and preliminary analysis of *Rhaphiodon echinus* (lamiaceae). *Brazilian Journal of Biology*, *79* (1), 87-99. doi: 10.1590/1519-6984.177447.

Poot–Pool, W. S.; van der Wal, H.; Flores–Guido, S.; Pat–Fernández, J. M.; Esparza–Olguín, L. (2015). Home garden agrobiodiversity differentiates along a rural—Peri–Urban gradient in Campeche, México. *Economic Botany*, *69*, 203-217. doi:10.1007/s10457-013-9637-6.

Rahman, A. (2013). An ethno-botanical investigation on Asteraceae family at Rajshahi, Bangladesh. *Academia Journal of Medicinal Plants*, *1* (5), 92-100. doi: 10.15413/ajmp.2013.0112.

Ribeiro, R. V.; Bieski, I. G. C.; Balogun, S. O.; Martins, D. T. D. O. (2017). Ethnobotanical study of medicinal plants used by Ribeirinhos in the North Araguaia Microregion, Mato Grosso, Brazil. *Journal of Ethnopharmacology*, *205*, 69-102. doi: 10.1016/j.jep.2017.04.023.

Ribeiro, V. P.; Arruda, C.; El-Salam, M. A.; Bastos, J. K. (2018). Brazilian medicinal plants with corroborated anti-inflammatory activities: a review. *Pharmaceutical Biology*, *56* (1), 253-268. doi: 10.1080/13880209.2018.

Ricardo, L. M.; Dias, B. M.; Mügge, F. L. B.; Leite, V. V.; Brandão, M. G. L. (2018). Evidence of traditionality of Brazilian medicinal plants: the case studies of *Stryphnodendron adstringens* (mart.) coville (barbatimão) barks and *Copaifera spp*. (copaíba) oleoresin in wound healing. *Journal of Ethnopharmacology*, *219*, 319-336. doi: 10.1016/j.jep.2018.02.042.

Saeed, M.; Naveed, M.; Arif, M.; Kakar, M. U.; Monzoor, R.; El-Hack, M. E. A.; Alagawany, M.; Tiwari, R.; Khandia, R.; Munja, A.; Karthik, K.; Dhama, K.; Iqbal, H. M. N.; Dadar, M.; Sun, C. (2017). Green tea (*Camellia sinensis)* and l -theanine: medicinal values and beneficial applications in humans-a comprehensive review. *Biomedicine & Pharmacotherapy*, *95*, 1260-1275. doi: 10.1016/j.apjtb.2016.06.010.

Sales, G. W. P.; Batista, A. H. D. M.; Rocha, L. Q.; Nogueira, N. A. P. (2015). Efeito antimicrobiano e modulador do óleo essencial extraído da casca de frutos da *Hymenaea courbaril* L. *Revista de Ciências Farmacêuticas Básica e Aplicada*, *35* (4), 709-715.

Silva, M. D. D., Nascimento, V. T. (2018). Conhecimento tradicional e estrutura populacional de jatobá da folha larga (*Hymenaea courbaril* L.), no povoado vau da boa esperança, barreiras oeste da Bahia. *Gaia Scientia*, *12*, 191-209. doi: 10.22478/ufpb.1981-1268.2018v12n1.30119.

Souza, L. F., Dias, R. F., Guilherme, F. A. G., Coelho, C. P. (2016). Medicinal plants referenced by “raizeiros” from Jataí county, Goias state. *Revista Brasileira de Plantas Medicinais*, 18 (2), 451-461. doi: 10.1590/1983-084X/15_173.

Uritu, C. M., Mihai, C. T., Stanciu, G-D., Dodi, G., Alexa-Stratulat, T., Luca, A., Leon-Constantin, M. M., Stefanescu, R., Bild, V.; Melnic, S., Tamba, B. I. (2018). Medicinal plants

of the family Lamiaceae in pain therapy: a review. *Pain Research and Management*, *2018*, 1-44. doi: 10.1155/2018/7801543.

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