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Relative importance of medicinal plants in the Semi-Arid Region of Paraíba: a case study in the Municipality of Congo (Paraíba, Northeast Brazil)

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Abstract. The study aimed to identify the ethnospecies used as phytotherapics in the treatment of diseases in the rural community of Santa Rita, municipality of Congo (Paraíba state, Northeast Brazil). We interviewed 93 informants (53 women and 40 men). The interviewees cited 37 vernacular names of plants, distributed in 38 species. Fabaceae, Euphorbiaceae, Bignoniaceae and Anacardiaceae were the most representative families. According to the calculation of the species' relative importance, *Syderoxylon obtusifolium*, *Ximenia americana*, *Myracodruon urundeuva*, *Cnidoscolus quercifolius*, *Ziziphus joazeiro* and *Trabebuia* sp. lead the ranking of the species cited, with RI > 1. These species are used to treat fairly common diseases among the community members, such as infections and pains in general. Data evidenced the current use of the most versatile species, as well as other less cited ones. Thus it is necessary to conduct more studies and produce more management plans to reduce the impact on them, especially on *M. urundeuva*.

Keywords: Caatinga; Ethnobotany; Biodiversity conservation.

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Introduction

According to Corrêa Junior (1991), human society has a lot of information about the environment where it lives, which allows the society to exchange information directly with the environment, satiating its survival needs. In this heritage is inserted the knowledge concerning the plants with which this society is in contact. Thus, the search and the use of plants with therapeutic properties is an activity that passes from generation to generation, described in order to preserve this ancient tradition, attested in various treaties of phytotherapy (Corrêa Junior, 1991).

Plants are used as the only therapeutic resource by a large part of the Brazilian population, and by more than two thirds of the world population; and the main factors that influence the continuity of this medicinal practice are the population's low quality of living, and the high cost of medicines (Argenta et al., 2011). Thus, users of plants from all over the world retain the use of phytotherapics, making valid some therapeutic information that has been accumulated for centuries (Newall et al., 2002).

The This knowledge of traditional communities involves relations of knowledge exchange among people and their understanding about the environment in which they live, and is permeated by social and cultural factors (Ferreira et al., 2012). The use of plant species for therapeutic purposes has been perpetuated throughout the history of human civilization through to the present day, and it is a common practice for much of the world population, often as the only resource for the treatment of diseases in certain communities and ethnic groups. Thus, the traditional communities provide important information about different ways of handling plant species in their daily lives (Pereira et al., 2011).

The requirements in building scientifically accepted knowledge about medicinal plants, both in the context of discovery and validation as in the application context has sometimes come into conflict with popular knowledge (Bittencourt et al., 2002). In other situations there have been attempts to dialogue among the representatives of popular knowledge and scientific knowledge. This may help explain why Brazil, with its mega plant diversity and numerous academic papers about medicinal plants, is incipient in the production of phytotherapic medicines (Newall et al., 2002). Therefore, ethnobotanical studies, and the various disciplines related to them, can serve as a way to elaborate projects to develop phytotherapic medicines for the communities involved, as well as the population in general, based on the people's ethnobiological knowledge (Martin, 1995).

Ethnobotanical studies, based on quantitative tests, have developed over time a tool for determining the relative importance of medicinal species (Bennett and Prance, 2000). The aim of this method is to demonstrate the versatility of species; as reference it uses the quantity of therapeutic indications a plant has, and the number of body systems attributed to the species (Bennett and Prance, 2000).

This research aimed to identify the ethnospecies used as phytotherapic medicines in the rural community of Santa Rita, in the municipality of Congo, Paraíba state, and therefore determine the relative importance of each species.

Materials and methods

The regional and local context of work

The Municipality of Congo is located in the Borborema Mesoregion and Cariri Ocidental Microregion, in the Semi-Arid Region of Paraíba State, Northeast Brazil (Figure 1). It is at an altitude of 480 m, located at the geographic coordinates 7° 47' 41" S and 36° 39' 42" W, about 212 km away from the state capital, João Pessoa. It borders on Serra Branca to the North (Paraíba), Coxixola and Caraúbas to the East (Paraíba), Camalaú and Sumé to the West (Paraíba) and the State of Pernambuco to the South. It has a total population of 4,692 inhabitants (1,748 in the rural area and 2,944 in the urban area), and a land area of

333,469 km², with a population density of 14.06 inhabitants/km² (IBGE, 2012).

The vegetation is composed mainly of caatinga with stretches of deciduous forest. The climate is tropical semi-arid (Köppen: Aw), with summer rains. The rainy season begins in November and ends in April, and the average annual rainfall is 431.8 mm. The Santa Rita Community, chosen for this study, is approximately 8 km away from the urban center. The local economy is mainly based on subsistence agriculture, especially corn and bean crops. Goat and sheep breeding is the community's main livestock activity; and there is also cattle breeding.

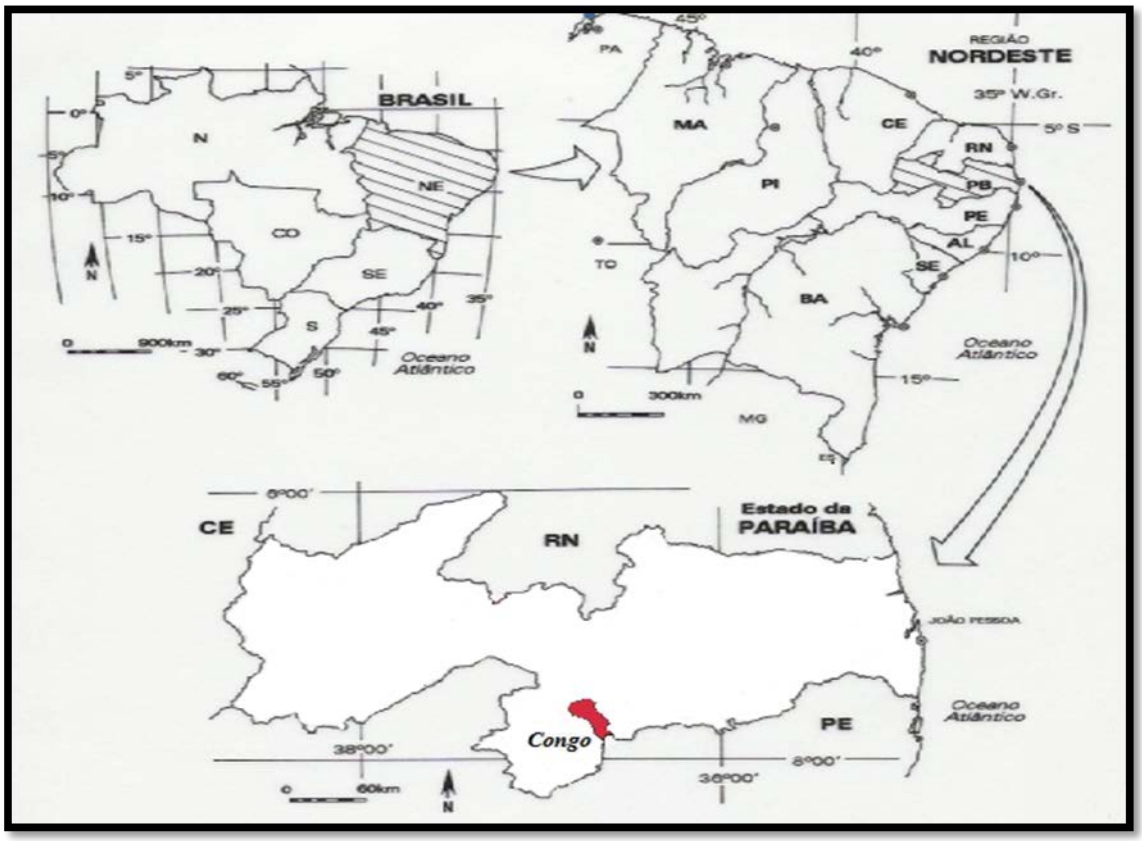

Figure 1. Geographical location of the municipality of Congo, Paraíba state, Northeast Brazil.

Ethnobotanical inventory

This research was carried out from March 2011 to July 2012. Semi-structured interviews were used to collect data (Albuquerque et al., 2010), and the informants were householders. We visited all the residences in the community studied, explaining the study purpose. When the householders were identified, they were invited to be part of the survey.

The informants, who agreed to participate, signed the Free and Transparent Consent form that is required by the National Health Council, through the Committee of Ethics in Research (Resolution No. 196/96). This study was approved by the Committee of Ethics in Research with Human Beings (CEP) of the Lauro Wanderley Hospital from the Federal University of Paraíba, registered in protocol CEP/HULW No. 297/11.

The data collected refer only to those described by informants who claimed to know the species used in traditional medicine and its applications. We interviewed 93 informants, divided into 53 women (19-76 years old) and 40 men (22-87 years old). The interview sought information about the local uses of medicinal plants and their classification

taking into consideration the plant part used, citations regarding preparation, body systems and disease citations through specific questions.

In order not to cause interference or influence others, the interviews were conducted individually and at different times for each informant, obtaining knowledge from each informant without any external influence during the interview (Phillips and Gentry, 1993).

Calculation of relative importance (RI)

The relative importance (RI) of each species was calculated according to the proposal of Bennett and Prance (2000), using the formula RI = NBS + NP, where: RI = relative importance, NBS = number of body systems, and NP = number of pharmacological properties. Using this index, the utility of plants reflects versatility of use, e.g., a greater number of therapeutic indications or body systems to which it belongs (Silva et al., 2014).

The relative importance of a species is directly related to its common uses in a community. This agreement of use can be measured, giving an idea of its local importance.

Results and Discussion

Medicinal plants

The interviewees from the community of Santa Rita reported a total of 37 vernacular names of plants, distributed in 32 identified species and four indeterminate species, set in 15 families. The most representative families were Fabaceae, Euphorbiaceae, Bignoniaceae and Anacardiaceae, related to the greater number of registered species (Table 1). In many studies, these families stand out, like in a study conducted in Rio Grande do Norte by Paulino et al. (2011), which reported 25 species for Fabaceae and eight for Euphorbiaceae. The importance of these families can also be observed in other studies conducted in the semi-arid region of Brazil (Rodal, 1992; Araújo et Al., 2005; Souza et Al., 2014). This highlight may be due to the presence of known woody species in these families, used in traditional medicine in the semi-arid region of Brazil.

Lamiaceae and Verbenaceae have been shown in many studies as two of the largest families (Lebsch and Acra, 2002; Oliveira et al., 2013.). However, in this study we did not identify any corresponding species to these families. This absence can be explained by the fact that most species of these families, regarding their size, are like herbaceous, which were not included in this survey, which registered only the use and knowledge of native species from Caatinga with arboreal size.

According to Bennett and Prance (2000), Lamiaceae, Asteraceae, Poaceae, Fabaceae and Malvaceae are the most predominant families on the list of exotic medicinal plants, and we have probably not registered these families because this study has prioritized only native species. Trotter and Logan (1986) state that species rich in essential oil such as those of the Lamiaceae family are culturally very important in terms of their use.

Used parts of medicinal plants

The bark of the plants was the most cited part, and is useful for both men and women (Table 2). These results are similar to those reported by Williams et al. (2000) about the importance of stem bark. Almeida and Albuquerque (2002) reported, in their study about medicinal plants, that some authors worry about the conservation of plants that have economic importance, which are used popularly by traditional communities, as well as trade in general (Farnsworth and Soejarto, 1985; Nicholson and Arzeni, 1993; Hersch-Martínez, 1995). These species have an aggravating factor, since collection techniques are highly aggressive, consisting of the removal of the stem bark, causing irreversible damage to the plants. In most cases, when there is not an effected removal method carried out in a conscious way, these techniques put the plant at risk of dying due to stress in its physiological dynamic (Almeida et al., 2002.; Albuquerque et al., 2007).

Figure 2. A: View of the municipality of Congo from "Serra da Engabelada," **B:** Serra da Engabelada, Congo-PB, **C** and **D:** houses in the Rural Community of Santa Rita, Congo, Paraíba State, Northeast Brazil.

The same can be seen in the study carried out by Albuquerque et al. (2011), which showed that the populations of *Myracrodruon urundeuva* Allemão (Aroeira) and *Syderoxylon obtusifolium* (Humb. ex Roem. & Schult.) T.D. Penn. (Quixabeira) did not show the J "inverted" model, typical of stable populations, since they showed few adult individuals, which were removed by selective cutting, which caused a change in the reproductive process and in the recruitment dynamic of the species, due to the absence of seeds that are produced by adult plants.

Thus, there is a tendency for these species to decline due to the excessive collection of the desired product, since the most important species are the most vulnerable.

Methods for preparing the plants

Regarding the methods for preparing the plants, we found out that sauce, topical use and "lambedor" (home-made syrup) were the most representative, compared with other ways, in both genders, with values of 127, 55 and 34 citations for men and 149, 70 and 66 citations for women, respectively. This result is grounded on the fact that the plants with a higher relative importance, such as *M. urundeuva*, *S. obtusifolium*, *Ximenia americana* L., *Ziziphus joazeiro* Mart. and *Trabebuia* sp (Table 3), have the bark as the main used part, which reflects on the method of preparation, where sauce and topical use correspond to an effective method to prepare a phytotherapic that needs the bark as raw material.

These results are similar to those reported by Oliveira et al. (2010) in relation to ethnospecies, their parts and preparation method used in traditional medicine. "Lambedor," as a form of use, is also mentioned by Lopes et al. (2012), and it was the main form of use, along with tea, both with 35%. For some authors, such as Castellucci et al. (2000) and Jacoby et al. (2002), the likely explanation for the increased use of bark and leaves is that the harvest is easier and there is a greater availability of these parts.

Table 1. Species of medicinal plants cited by interviewees from the Rural Community of Santa Rita, Municipality of Congo, Paraíba State, Northeast Brazil.

Family	Species	Voucher	Nº de citations	Vernacular name
Anacardiaceae	*Myracrodruon urundeuva* Allemão	17,632	64	Aroeira
	Schinopsis brasiliensis Engl.	17,255	11	Baraúna
	Spondias tuberosa Arruda	17,556	6	Umbuzeiro
Apocynaceae	*Aspidosperma pyrifolium* Mart.	17,566	4	Pereiro
Arecaceae	*Syagrus oleracea* (Mart.) Becc	17,567	9	Côco catolé
Bignoniaceae	*Tabebuia aurea* (Silva Manso) Benth. & Hook. f. *ex* S. Moore	17,641	1	Craibeira
	Tabebuia impetiginosa (Mart *ex* DC) Standl.	-	3	Pau d'arco roxo
	Tabebuia sp	-	17	Pau d'arco
Burseraceae	*Commiphora leptophloeos* (Mart.) J. B. Gillet	17,642	2	Umburana
Celastraceae	*Maytenus reigida* Mart.	17,615	14	Bom-nome
Combretaceae	*Combretum fruticosum*	-	21	Mufumbo
Euphorbiaceae	*Cnidoscolus quercifolius* Pohl.	17,581	30	Favela
	Croton blanchetianus Baill.	17,249	12	Marmeleiro
	Croton rhamnifolius Kunt.	-	6	Velame
	Jatropha mollissima (Pohl.) Baill	17,578	29	Pinhão brabo
	Jatropha ribifolia (Pohl.) Baill	-	1	Pinhão manso
Fabaceae	*Amburana cearensis* (Allemão) A. C. SM.	17,638	1	Cumarú
	Anadenanthera colubrina (Vell) Brenan	17,630	39	Angico
	Bauhinia cheilanta (Bong.) Steud.	17,648	9	Mororó
	Erytrina velutina Wild.	17,563	2	Mulungu
	Hymenoca courbaril L.	17,582	13	Jatobá
	Inga sp	-	1	Ingazeira
	Libidibia ferrea (Mart. *ex* Tul.) L. P. Queiroz	17,639	8	Jucá
	Mimosa tenuiflora Wild. Poir.	17,626	46	Jurema preta
	Piptadenia stipulacea (Benth.) Ducke.	17,877	2	Jurema branca
	Poincianella pyramidallis Tul.	17,234	59	Catingueira
Malvaceae	*Pseudobombax marginatum* (A. St.-Hill., Juss. & Cambess) A. Robyns	17,562	9	Imbiratã
Meliaceae	*Cedrela odorata* L.	-	1	Cedro
Olacaceae	*Ximenia americana* L.	17,557	63	Ameixa
Rhamnaceae	*Ziziphus joazeiro* Mart.	17,575	58	Juazeiro
Rubiaceae	*Tocoyena formosa* (Cham. & Schltdle) K. Schum	-	2	Jenipapo brabo
Sapotaceae	*Syderoxilum obtusifolium* (Roem & Schult.) T. D. Penn	17,625	137	Quixabeira
Indeterminte	Indet. 1	-	1	Jaramataia
	Indet. 2	-	16	Catinga branca
	Indet. 3	-	2	Pau leite
	Indet. 4	-	1	Pau piranha

Table 2. Parts of medicinal plants used by men and women in the rural community of Santa Rita, municipality of Congo, Paraíba state, Northeast Brazil.

Parts of plants cited by men	Nº of citations	Parts of plants cited by women	Nº of citations
Bark	261	Bark	304
Entrecasca	6	Entrecasca	16
Flower	10	Flower	19
Leaves	11	Leaves	34
Fruit	3	Fruit	2
Latex	21	Latex	20
Root	9	Root	6
Seed	2	Seed	1
Total	**323**	**Total**	**402**

Table 3. Citations of medicinal plant preparation method by men and women from the Rural Community of Santa Rita, Municipality of Congo, Paraíba State, Northeast Brazil.

Preparation by men	Nº of citations	Preparation by women	Nº of citations
Bath	7	Bath	11
Sitz bath	5	Sitz bath	24
Tea	20	Tea	22
Decoction	26	Decoction	38
Garrafada	16	Garrafada	0
Infusion	10	Infusion	9
Ingestion	6	Ingestion	7
Lambedor	34	Lambedor	66
Chew	16	Chew	7
Sauce	127	Sauce	149
Topical use	55	Topical use	70
Total	322	**Total**	403

Body systems related to the use of medicinal plants

The main medical categories related to the number of species citations were undefined diseases or undefined pains, respiratory system disorders, skin and subcutaneous tissue lesions and digestive system disorders. According to Almeida and Albuquerque (2002), generally, digestive system disorders and skin diseases are the most frequent categories mentioned for treatments with medicinal plants. These two categories were widely cited during the interviews in our study.

The three categories most frequently mentioned in ethnobotanical surveys are gastrointestinal, respiratory and dermatology, with a large number of species mentioned (Albuquerque and Andrade, 2002; Heirinch et al., 1998).

Nicholson and Arzeni (1993) cited, in their study, several species for respiratory diseases (including antitussive, expectorant and pectoral plants) and digestive diseases (including carminative, laxative and purgative plants). Milliken and Albert (1997) found, among the Yanomami Indians, a wide variety of plants used for fever (60), intestinal and stomachal disorders (35), and for malaria (24) and diarrhea (23), which is similar to the results found in this study.

The results found by Johns et al. (1994) confirmed the importance of knowledge about plants for treating gastrointestinal and respiratory problems in different cultures. In the study conducted with the Batemi in Tanzania, these two categories concentrated together a total of 62 registered medicines, as well as

febrifuges and tonics (87 records of medicines).

Cited diseases

Among the cited diseases, the most significant were: cough (67), general inflammation (65), cicatrizing (41), lump removal (37) cancer (36), stomach inflammation (33), malaise (25), inflammation in the uterus (25), diabetes (24) and blow (mechanical shock) (21).

Anaderanthera columbrina (Vell.) Brenan (Angico), *Amburana cearensis* (Allemão) A. C. Sm. (Cumarú) and *Hymenoca coubaril* L. (Jatobá) species, all of them belonging to the Fabaceae family, were recommended for the treatment of cough, which is similar to the results found by Lopes et al. (2012), demonstrating the importance of the species belonging to this family for the treatment of these diseases. According to these authors, *S. obtusifolium* and *M. urundeuva* proved to be useful in the treatment of wounds, assisting as cicatrizing, and in the treatment of general inflammations. And Oliveira et al. (2010) demonstrate the greater versatility of *M. urundeuva*, to which they assign various utilities such as the treatment of cancer and gastritis, abortion, stomach cramps and diarrhea.

Relative importance of the plants (RI)

Six species showed great versatility of use, with RI > 1 indicated for ten body systems: *S. obtusifolium* (RI = 2.0), *X. americana* (RI = 1.5), *M. urundeuva* (RI = 1.49), *C. quercifolius* (RI = 1.17), *Z. joazeiro* (RI = 1.1) and *Trabebuia* sp (RI = 1.08) (Table 4). Most of the species are native and have arboreal characteristics. Almeida and Albuquerque (2002) mentioned that the use of species with IR > 1 has also been reported in other regions of Brazil, and they exemplify a study about the plants used in folk medicine in the state of Mato Grosso, in which Guarim Neto (1987) mentions the use of stem bark of quixaba (*S. obtusifolium*) against ovary inflammations and any other type of wound. In another study conducted in 13 areas of Rio Grande do Norte to determine the relative importance and the richness of native shrub tree species of medicinal use, Paulino et al. (2011) found that *M. urundeuva*, *Trabebuia* sp, *Z. joazeiro*, *S. obtusifolium*, *Cnidoscolus quercifolius* Pohl. and *Ximenia americana* L. presented IR = 1.76, 1.65, 1.43, 1.19, 1.04 and 1.04, respectively, demonstrating that these species have high versatility, which can also be observed in our study. Some authors report that *S. obtusifolium* is widely used in folk medicine as an analgesic, astringent, tonic, anti-inflammatory and anti-diabetic, with the bark the most used part for these diseases (Agra, 1996; Braga, 1976; Mors et al., 2000; Lorenzi, 2002; Agra et al., 2007; Santos et al., 2008; Pedrosa et al., 2012).

Matos (2007) found that extracts of plum leaves (*Ximenia americana*) have antimicrobial activity, acting against *Escherichia coli*, *Pseudomonas aeruginosa* and *Candida albicans*, due to the tannins, flavonoids, alkaloids, saponins, anthraquinones and glycosides present in this species.

Faveleira (*C. quercifolius*) was indicated by all interviewees as a medicinal plant, and they refer to its wide use as cicatrizing, especially the bark *in natura* or in powder form, and they also refer to the water from the bark for healing wounds in humans and other animals, such as latex against toothache. The use of *C. quercifolius* as a phytotherapic by inhabitants from the semi-arid region (Northeast Brazil) is reported by Bezerra (1972), and according to this author, its inner bark has cicatrizing and disinfectant properties.

A study about popularly used plants in Cariris Velhos, Paraíba state, Agra (1996) reports the use of *C. quercifolius* stem bark and inner bark macerated in infusions or decoctions for ovary inflammation and inflammation in general. The use of latex is mentioned against dermatosis and wart cauterization. Daunt et al. (1987) cite the use of latex as cicatrizing and blood clotting. In this study, one of the interviewees claimed they used the latex from faveleira to cure toothaches, reporting that they put drops of “favela’s milk”

(latex) on the aching tooth and afterwards feltl relief from their pain.

Just like the plum (*Ximenia americana*), the juazeiro (*Ziziphus joazeiro*) also has antimicrobial activities, and contains, in its leaves and bark, tannins and flavonoids that are quite effective in combating gram-positive (*Staphylococcus aureus*, *Bacillus subtilis*, *Mycobacterium smegmatis*, *Enterococcus faecalis*, *Micrococcus luteus* and *Streptococcus pyogenes*) and gram-negative (*Candida albicans*, *Serratia marcescens*, *Klebsiella pneumoniae*, *Enterobacter aerogenes*, *Proteus mirabilis* and *Proteus vulgares*) bacteria (Silva et al., 2011). In this study, the juazeiro received therapeutic indications for insomnia, seborrhea, cough, wounds, sore throat and itching in general. Cruz et al. (2007) and we discovered that *Candida albicans* is sensitive to aqueous extract of *Z. joazeiro* barks.

Pau d'arco or Ipê (*Tabebuia* sp) was shown to cure ulcers, liver disease, cough, flu and vaginal discharge, among others. The tea from the bark and inner bark, according to Barreto (1990), is used as a diuretic, and the roots tanned in cachaça or wine are used for the treatment of flu.

Figure 3. Some medicinal species with high use citations in the Community of Santa Rita, Congo-PB. **A:** *Ziziphus joazeiro* Mart., **B:** *Syderoxylon obtusifolium* (Roem. & Schult.) T. D. Penn, **C:** *Poincianella pyramidalis* Tull., **D:** *Anadenanthera colubrina* (Vell) Brenan.

Appreciation of traditional knowledge by men and women

Both men and women provided a large number of use citations for *S. obtusifolium*, *X. americana*, *M. urundeuva* and *C. quercifolius*. However, *S. obtusifolium*, due to its versatility, according to the calculation of relative importance, stood out among women with a higher number of citations, outperforming the other species reported in this study.

According to Alves et al. (2008), *S. obtusifolium* and *M. urundeuva* are part of the versatile species group, present in almost all categories of common use between genders.

Lucena (2005) states that women, generally, give a greater number of citations for plants than men. This can be explained by the fact that women have a greater knowledge of medicinal plants, although in our study men also demonstrated knowledge, by the fact that all the medicinal use citations for *Z. joazeiro* and *Trabebuia* sp were mentioned by men. These results demonstrated that it is not only women, as housewives, that hold knowledge related to non-timber categories, such as food and medicines, but men too.

Albuquerque et al. (2011), while studying the traditional knowledge of the Fulni-ô Indians about medicinal plants, in the state of Pernambuco, found that men have a greater knowledge about the quantity of useful plants than women, showing that this knowledge may change according to gender in regions with the same phytophysiognomies.

Albuquerque et al. (2011) state that there is no established consensus in the literature regarding the influence of gender, although women have the ability to demonstrate, frequently, that they have more expertise in this subject. Voeks (2007) says that in rural areas and in small towns in Brazil, women are responsible for diagnosing diseases, and they recommend the treatment and indicate the specific herb for every disease.

Table 4. Relative Importance (RI) values of each species of medicinal plant known by the informants from the Rural Community of Santa Rita, Municipality of Congo, Paraíba State, Northeast Brazil.

Family / Species	Relative Importance (RI)
Anacardiaceae	
Myracrodruon urundeuva Allemão	**1.49**
Schinopsis brasiliensis Engl.	0.52
Spondias tuberosa Arruda	0.4
Apocynaceae	
Aspidosperma pyrifolium Mart.	0.55
Arecaceae	
Syagrus oleracea (Mart.) Becc	0.66
Bignoniaceae	
Tabebuia aurea (Silva Manso) Benth. & Hook. f. *ex* S. Moore	0.14
Tabebuia impetiginosa (Mart *ex*. DC) Standl.	0.41
Tabebuia sp.	**1.08**
Burseraceae	
Commiphora leptophloeos (Mart.) J. B. Gillet	0.73
Celastraceae	
Maytenus reigida Mart.	0.76
Combretaceae	
Combretum fruticosum	0.7
Euphorbiaceae	
Cnidoscolus quercifolius Pohl.	**1.17**
Croton blanchetianus Baill.	0.27
Croton rhamnifolius Kunt.	0.45
Jatropha mollissima (Pohl.) Baill	0.49
Jatropha ribifolia (Pohl.) Baill	0.14
Fabaceae	
Amburana cearensis (Allemão) A. C. Sm.	0.7
Anadenanthera colubrina (Vell) Brenan	0.97
Bauhinia cheilanta (Bong.) Steud.	0.55
Erytrina velutina Wild.	0.14
Hymenoca courbaril L.	0.45

Table 4. Continued.

Family / Species	Relative Importance (RI)
Inga sp.	0.14
Libidibia ferrea (Mart. *ex* Tul.) L. P. Queiroz	0.59
Mimosa tenuiflora Wild. Poir.	0.83
Piptadenia stipulaceae (Benth.) Ducke.	0.14
Poincianella pyramidallis Tul.	0.91
Malvaceae	
Pseudobombax marginatum (A. St.-Hill., Juss. & Cambess) A. Robyns	0.72
Meliaceae	
Cedrela odorata L.	0.14
Olacaceae	
Ximenia americana L.	**1.5**
Rhamnaceae	
Ziziphus joazeiro Mart.	**1.1**
Rubiaceae	
Tocoyena formosa (Cham. & Schltdle) K. Schum	0.27
Sapotaceae	
Syderoxilum obtusifolium (Roem & Schult.) T. D. Penn	**2.0**
Indeterminates	
Indet. 1	0.14
Indet. 2	0.14
Indet. 3	0.9
Indet. 4	0.17
Indet. 5	0.14
Indet. 6	0.17

* Species that have the RI in bold are considered the most versatile.

Final remarks

This work showed the importance that native medicinal species, in the semi-arid region, have for the residents from the community of Santa Rita, municipality of Congo, who demonstrated an expressive knowledge about the local plants' richness, as well as their relative importance, which is reflected by the usefulness of these species for meeting the local needs of the community.

Syderoxylon obtusifolium, *Ximenia americana*, *Myracodruon urundeuva*, *Cnidoscolus quercifolius*, *Ziziphus joazeiro* and *Trabebuia sp*. are the most important medicinal plants for the community, highlighted by the high rate of relative importance. These species are used against quite common diseases, such as infections and pains in general, and diseases that affect the respiratory and digestive systems.

The data show the current use of these species, and studies to assess the impact on them are necessary, especially on *M. urundeuva*, which is an endangered species. The other species, *S. obtusifolium*, is almost unavailable according to studies conducted in the semi-arid region of Paraiba. Therefore, deeper studies are necessary to analyze the availability of these species in vegetation, in an attempt to understand their ecology and the dynamics of use among the local residents.

Conflict of interest statement

Authors declare that they have no conflict of interests.

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