

Knowledge and use of medicinal plants in the Semiarid Region of Brazil

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Abstract. This study aimed to record the knowledge and use of medicinal species in the Semiarid Region of Paraíba, Northeast Brazil. Interviews were conducted with 100% of homeowners (men and women). We calculated the Relative Importance Index (RI) to determine local most important species. We recorded 45 species, 41 genera and 20 families. The most representative families were Fabaceae (12 spp.), Euphorbiaceae (5 spp.) and Anacardiaceae (4 spp.). *Myracrodruon urundeuva* Allemão and *Syderoxylum obtusifolium* (Roem & Schult.) T. D. Penn. were the most prominent species. There were 17 medicinal plants that showed great versatility in their use of $RI > 1$. There was predominance for treatment of respiratory system disorders, undefined diseases or undefined pain, digestive and genitourinary system disorders, and general inflammation and cicatrizing the two most cited diseases. The bark was the most used part with 1,399 use citations, and sauce was the main method of preparation (586 citations). This study demonstrated a greater use of two endangered species in the Caatinga, revealing conservation concerns.

Keywords: Caatinga, Ethnobotany, Traditional populations.

Introduction

The Caatinga ecosystem is represented by shrubby and shrubby-arboreal vegetation that support long dry seasons, low annual amounts of rain and high temperatures during a part of the year (Bernardes, 1999; Alves et al., 2009). It has a rich diversity and heterogeneous landscapes, whose soils are unable to hold water, and its vegetation provides timber and non-timber resources for local

populations that live mainly in rural areas (Fernández, 1998; Albuquerque and Andrade, 2002a; Maia, 2004; Ferraz et al., 2005).

Many ethnobiological studies have been conducted lately regarding the use of biodiversity resources by populations from different regions and ethnic groups. Among different approaches, the field of ethnobotany has been the most developed with a focus on medical use of biodiversity, and there is currently a large number of

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scientific papers in this area of knowledge (Prance, 1991; Begossi, 2001; Garlet and Irgang, 2001; Almeida et al., 2002; Amorozo, 2002; Brito and Senna-Valle, 2011; Costa and Mayworm, 2011; Zucchi et al., 2013).

Ethnobotany seeks to rescue and evaluate the traditional botanical knowledge related to the use of plant resources, making it possible to identify the origin, distribution and diversity of cultivated plants over time (Guarim Neto et al., 2000; Albuquerque, 2005). According to Lacerda et al. (2013), support for this field of science has strengthened, especially in Latin American countries. However, there are few ethnobotanical studies that have been carried out in the state of Paraíba, Northeast Brazil, despite a great research interest in the topic (Marinho et al., 2011). Due to the low number of studies in Paraíba, researchers and research groups now seek to expand the ethnobotanical register in the State, such as the researchers from the Ethnoecology Laboratory of the Agricultural Science Center in the Federal University of Paraíba.

Human beings live with a huge diversity of plant resources, developing various ways to use them for different purposes; the plants are often their only survival resource, and they use them for therapeutic purposes (Oliveira et al., 2010). The practice of using plant species to cure diseases is common among the population, especially in developing countries, where the majority of the population is poor and there are difficulties obtaining synthetic medicines (Ayyanar and Ignacimuthu, 2005).

With the excessive use of these plant resources, the ecosystems have suffered from enormous amounts of destruction, which compromises its biodiversity, directly affecting the survival of the plants with medical potential and consequently its availability. In turn, this may lead to local extinction. However, some human communities have their own management methods, taking from the environment only what they need, bringing minimum losses. These practices are the result of experience gained over centuries of relationships with natural resources. In most cases, the communities' techniques

are more effective than are the techniques that scientists want to put into practice, since the first ones are adapted to the climatic conditions, soil and vegetation of the area. These traditional management techniques greatly contribute to biodiversity maintenance (Albuquerque and Andrade, 2002a; Pasa and Ávila, 2010).

The phytotherapy is known as an area of knowledge that seeks the cure and the treatment of diseases, using the properties of medicinal plants, which are used by the people as teas, infusions and "lambedores" (homemade tea). This popular empirical knowledge has been recognized and incorporated into scientific knowledge, and some science areas have contributed to the expansion of therapeutic uses for medicinal plants (Dantas and Guimarães, 2007).

The use of plant species for medicinal purposes is enriched by various cultures, and in some countries, the tradition of using plants to make homemade preparations in order to treat diseases demonstrates the origin and descent of these places (Maia et al., 2011). The use of a particular plant resource type to treat, cure and prevent diseases is one of humanity's oldest practices, and the collection of this information in the communities is necessary to rescue and enhance the knowledge of these people (Pasa, 2011; Silva et al., 2012a). However, interest in phytotherapy has been increasing more and more, thus the conservation of medicinal plants has received more attention, and in some cases, these species are seen as one of the biodiversity conservation strategies, receiving a special focus since the local communities depend on them (Jha, 1995; Dhar et al., 2000; Gera et al., 2003).

On some occasions, the economic situation and the tradition of the communities from some Third World countries encouraged people to use medicinal plants for primary health care, which was found to be quite effective in curing diseases (Rodrigues and Casali, 2002). In Brazil, this practice occurs mainly in families with low income. These families typically have elderly and children at home. These families often do not acquire synthetic medicines because they are considered a high cost item relative to the

household income (Calixto and Ribeiro, 2004).

Currently, medicinal plants are still widely used in folk medicine to prepare homemade remedies, which are then sold in street fairs and popular markets, and are found in residential yards. This probably happens because of the difficulties that these populations have relative to the current health systems (Brito and Senna-Valle, 2011; Silva et al., 2012b). The areas most affected by this are rural communities that have difficulties in accessing health care because there is not, in some cases, a health unit equipped and available. In addition, the poor condition of the roads and means of public transportation are other factors that influence this practice (Brito and Senna-Valle, 2011).

Studies show that women have a greater knowledge about medicinal plants compared to men, because they are responsible for the health of the family, working in the yards and caring for the home vegetable gardens (Camou-Guerrero et al. 2008; Lucena et al., 2011; Carvalho et al., 2012; Guerra et al., 2012). But, according to Merétika et al. (2010), gender and age factors may not be considered the only factors that interfere in the distribution of traditional knowledge in a community, as there are other factors that affect this process of knowledge acquisition. According to Ceolin et al. (2011), to understand this popular knowledge about medicinal plants, we need to know the “world” in which these people live, their beliefs, values and culture, which are all factors that influence the practice of health care.

Given the above information about medicinal plants, this study aimed to register the knowledge and use of medicinal plants in five rural communities located in the Semiarid Region of Paraíba State, Northeast Brazil, assessing the relative importance (RI) of native woody species from Caatinga.

Materials and methods

Geoenvironmental characterization

The study was conducted in the Municipalities of Itaporanga, Lagoa,

Remígio, Solânea and São Mamede in Paraíba State, NE Brazil (Figure 1). We visited the communities of Pau d’Arco (Itaporanga), Barroquinha (Lagoa), Coelho (Remígio), Várzea Alegre (São Mamede) and Capivara (Solânea). In general, the residences in these communities are distributed in private farms, and do not characterize aspects of communitarian villages. The local economy is based on subsistence agriculture, with a predominance of corn and bean crops, and cattle and goat breeding. They all have monthly medical assistance through visits from health agents, and children and teenagers go to the urban center for educational activities. Another common characteristic in these communities is that poorer families are assisted through government assistance with social projects, known in Brazil as the “Bolsa Família” (families with *per capita* income less than R\$ 77 monthly, received from the government as cash) “Água para Todos” (Universalization of Access and Use of Water National Program) and “Pronaf” (National Family Farming Strengthening Program).

Itaporanga – Community of Pau d’Arco

The Municipality of Itaporanga is located in the Sertão Mesoregion and the Vale do Piancó Microregion, in the Semiarid Region of Paraíba State, Northeast Brazil, at the geographic coordinates 7° 18’ 14” S and 38° 09’ 00” W, at an altitude of 191 m. It is 420 km from the state capital, João Pessoa, and can be accessed by the highways BR-361, PB-372 and PB-386. It borders the Municipalities of Aguiar and Igaracy (North), Boa Ventura, Diamante and Pedra Branca (South), São José Caiana (East), and Piancó and Santana dos Garrotes (West). Studies in the field of ethnobotany have been conducted in an attempt to know the useful plant species in rural communities in the Vale do Piancó (Lucena et al., 2012c; Leite et al., 2012; Sousa et al., 2012). Itaporanga has a total population of 23,192 inhabitants (11,389 men and 11,803 women) and a land area of 468.064 km², with a population density of 49.55 inhabitants/km². It has a hot semiarid

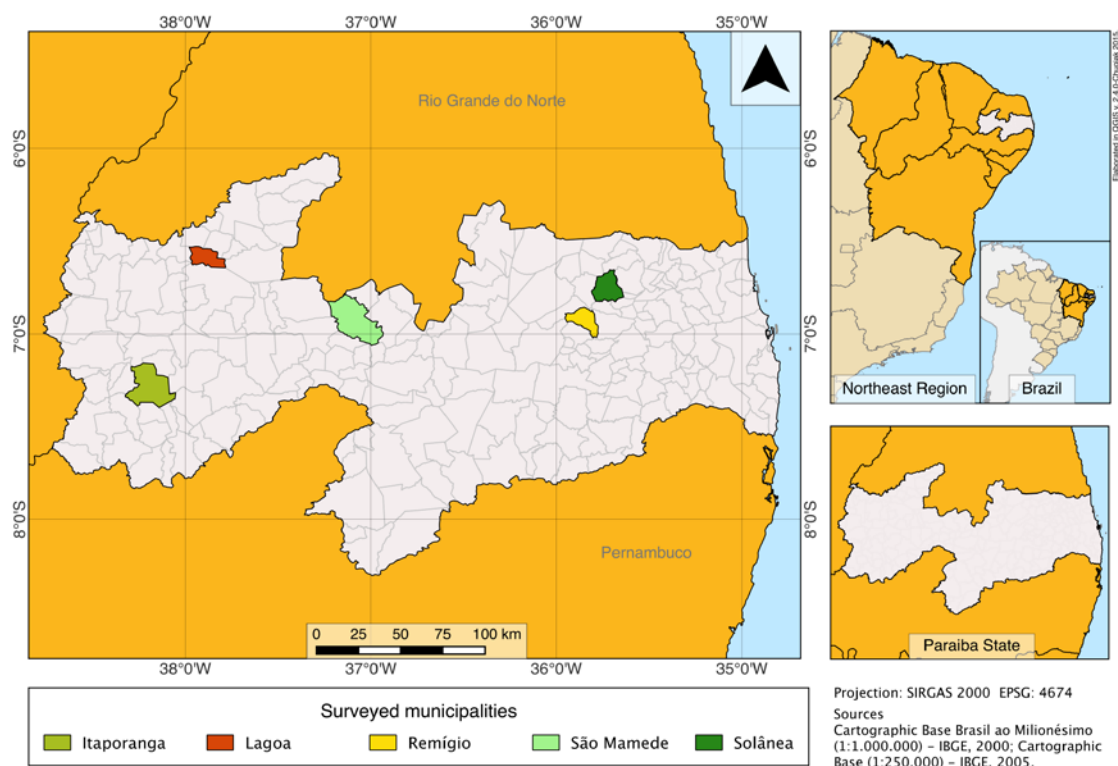


Figure 1. Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea location, in the Semiárid Region of Paraíba State, Northeast Brazil.

climate with a short rainy season (IBGE, 2012).

The Community of Pau d'Arco is approximately 8 km from Itaporanga's Urban Center. It has a Catholic Chapel, seven private dams, a soccer field and an unused school, so the children of this community go to the neighboring community (Community of São Pedro) to have access to education in the Municipal Elementary School "Joaquim Gomes Melo" (Leite et al., 2012).

Lagoa – Community of Barroquinha

The Municipality of Lagoa is located in the Catolé do Rocha Microregion and Sertão Mesoregion in the Semiárid Region of Paraíba State, Northeast Brazil, at the geographic coordinates 6° 34' 15" S and 37° 54' 57" W, 394 km from the state capital, João Pessoa. There is access to the highways BR-325 and BR-230. It has a total population of 4,681 inhabitants (2,304 men and 2,377 women) and a land area of

177.901 km², with a population density of 26.31 inhabitants/km². It has a hot semiárid climate with an average temperature of 27 °C, with drought period that can last up to 11 months (IBGE, 2012). It borders the Municipalities of Bom-Sucesso, Jericó, Mato Grosso, Pombal, Paulista and Santa Cruz.

The rural Community Barroquinha is approximately 1 km from the urban center of Lagoa. There are three sierras in Barroquinha, called Claudiano, Zé Rodrigues and Balanço. The local economy is based on livestock, especially sheep, goat and cattle breeding. Other important activities are bean, tobacco, cotton and corn crops and cacti (Lucena et al., 2012a). Regarding knowledge about the useful plant resources in the community, there is the need to conduct more ethnobotanical studies to evaluate the utilitarian potential of the semi-arid species (Carvalho et al., 2012). The best timber use in the rural community of Barroquinha seems to be best explained by ecological apparency.

Remígio – Community of Coelho

The Municipality of Remígio is located in the Curimataú Ocidental Microregion, in the Semiarid Region of Paraíba State, Northeast Brazil, at the geographic coordinates 06° 54' 10" S and 35° 50' 02" W. It has an approximate altitude of 593 m, 157 km from the state capital, Joao Pessoa, with access through Highways BR-104, PB-079 and PB-105. It has a total population of 17,581 inhabitants (4,630 in the rural area and 12,951 in the urban area) and a land area of 177.999 km², with a population density of 98.77 inhabitants/km² (IBGE, 2010). The climate is tropical rainy, with dry summer. The rainy season starts in January or February and ends in September or October.

The Community of Coelho is approximately 7 km from the urban center of Remígio. The economy is predominantly subsistence agriculture, mainly rainfed agriculture (rainfed agriculture is an agricultural technique to cultivate land where rainfall is low), and the main products are corn and beans. In livestock, cattle breeding stands out, and there is also goat and sheep breeding.

São Mamede – Community of Várzea Alegre

The Municipality of São Mamede is located in the Borborema Mesoregion and Seridó Ocidental Microregion, in the Semiarid Region of Paraíba State, Northeast Brazil. With an approximate altitude of 263 m, located at the geographic coordinates 55° 06' 37" S and 37° 05' 45" W, it is 278 km from the state capital, João Pessoa. Its total population is 7,748 inhabitants (1,819 in the rural area and 5,729 in the urban area), and has a land area of 530.725 km², with a population density of 14.6 inhabitants/km² (IBGE, 2012). According to the Köppen classification, the climate is Bsh: hot semiarid, with summer rainfall and an average temperature of 28 °C.

The rural Community of Várzea Alegre is approximately 8 km from the urban center of São Mamede. The economy is predominantly rainfed agriculture (only during rainy periods); corn and bean are the main crops. In livestock, cattle breeding for milk production is the main activity, and

there is also goat and sheep breeding. Regarding the use of cactaceae, studies show that the population of São Mamede has knowledge about the use of cacti, which has an importance in the inhabitants' daily life (Lucena et al., 2012b). Regarding the local use of native species, the *Bauhinia pentandra* is the most important (Guerra et al., 2012). *Cereus jamacaru* DC., *Melocactus* sp., *Pilosocereus chrysostele*, *Nopalea cochenillifera*, *Pilosocereus gounellei* are the most significant species related to the knowledge and use of cacti (Lucena et al., 2012b).

Solânea – Community of Capivara

The Municipality of Solânea is located in the Agreste Mesoregion and Curimataú Oriental Microregion, in the Semiarid Region of Paraíba State, Northeast Brazil, with an approximate altitude of 626 m, at the geographic coordinates 06° 46' 40" S and 35° 41' 49" W, approximately 138 km from the state capital, João Pessoa. Its total population is 26,689 inhabitants (7,357 in the rural area and 19,332 in the urban area) and it has a land area of 232,096 km², with a population density of 115,01 inhabitants/km² (IBGE, 2010).

The Community of Capivara is approximately 15 km from the urban center. The economy is based on agriculture, with the cultivation of corn, beans and manioc as the main agricultural products. The main livestock activities are cattle, goat and sheep breeding. The community uses plants as a source of energy, as well as for other purposes. This relationship has been studied by ethnobotany (Ribeiro et al., 2014; Silva, et al., 2014).

Botanical and Ethnobotanical data collection

Semi-structured interviews were conducted with men and women at different times (Albuquerque et al., 2010), in all community residences, with 100% of household heads, that is, the man and the woman, considering two informants for home when possible. Informants were selected intentionally and not randomly. We interviewed 15 people in Itaporanga (eight men and seven women), 66 in Lagoa (25

men and 41 women), 42 in Remígio (19 men and 23 women), 112 in Solânea (53 men and five women) and 37 in São Mamede (18 men and 19 women), totaling 272 informants. The difference between the number of men and women was due to the informants' marital status, by the presence of widowers, widows, singles or divorced people in the communities studied.

Before starting the interview with each person, the aim of the study was explained. Afterwards, we invited the informant to sign the Free and Transparent Consent form required by the National Health Council, through the Ethics Committee in Research (Resolution no. 196/1996). 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 under Protocol CEP/HULW no. 297/2011.

The form used to obtain the data involved questions regarding the knowledge of the informants about the use of plant species for medicinal purposes, found in the region, emphasizing the known species and their uses, preparations and parts used, which were defined more precisely and objectivity during the interviews; we also sought socioeconomic information, such as education level, age, occupation, monthly income, family composition, residence time and marital status. The names of the plants were recorded according to the pronunciation of the interviewees.

The plants were collected and herborized in the field, and were then processed, identified and incorporated into the Jaime Coelho de Moraes Herbarium (EAN) of the Federal University of Paraíba (UFPB) at the Agricultural Sciences Center (CCA). The plants were identified by the Curator of the Herbarium.

Data Analysis

For this study, we used the distinction between the current use and potential use citations, where the current citations are the ones about the plants that the informants actually use in their daily lives, and the potential citations are those ones only recognized and no longer used by

them. This distinction was made during the interviews, asking the informants to say what uses were expended or not.

For each identified species we calculated the relative importance based on the Bennett and Prance (2000) proposal. This technique highlights the importance of plants in relation to their versatility, considering the number of indications they have. However, this technique does not always mean that the plant with a greater number of indications is the most important. The formula used to calculate the relative importance is $RI = NBS + NP$, where the maximum value obtained in this calculation is 2. NBS corresponds to the number of body systems, which is a result of dividing the number of body systems treated by a particular species (NBSS) by the total number of body systems treated by the most versatile species (NBSVS). So:

$$NSC = \frac{NBSS}{NBSVS}$$

NP is the number of properties resulting from dividing the number of determined properties for a particular species (NPS) by the number of properties assigned to the most versatile species (NPVS). So:

$$NP = \frac{NPS}{NPVS}$$

The therapeutic indications mentioned by the informants were grouped into 17 categories, established by the World Health Organization (OMS, 2000) and Almeida and Albuquerque (2002), which are undefined diseases or undefined pains; physical or mental weakness; skin and subcutaneous tissue diseases; endocrine glands, nutrition and metabolism diseases; blood and blood-forming organs diseases; musculoskeletal system and connective tissue diseases; infectious and parasitic diseases; sexual inappetency; skin and subcutaneous tissue lesions; neoplasm; respiratory, sensory (eyes and ears), cardiovascular, genitourinary, nervous and digestive systems disorders.

Results

We registered 51 native plants with medical potential. Of these, 45 species were identified and distributed into 41 genera and 20 botanical families; the most numerous families were Fabaceae (12 spp.), Euphorbiaceae (5 spp.) and Anacardiaceae (4 spp.) (Table 1). The most representative species among men and women were *Myracrodruon urundeuva* Allemão (Aroeira), with 262 use citations and *Syderoxilum obtusifolium* (Roem and Schult.) T.D. Penn (Quixabeira), with 185 citations. These species showed high versatility in medicinal uses.

The most used plant parts were the bark, with 1,399 use citations, inner bark, with 291 and flower, with 135 (Figure 2). Regarding the preparation method, sauce was the most prominent, with 586 use citations, followed by topical use, with 371 (Figure 3). In general, the body system categories that had a greater prominence in terms of numbers of use citations were respiratory system disorders, with 487 citations, and undefined disease or undefined pains not defined, with 450 citations, followed by digestive system disorders, with 271 use citation (Figure 4).

Regarding the citations by genders, the bark was also the most used part, with 894 use citations by women, followed by inner bark, with 167 citations (Table 2). With 505 use citations, the bark was also the most cited part by men, followed by inner bark with 124 citations (Table 3). Related to the citations about the method of preparation, women most cited the use of sauce, with 279 use citations, followed by topical use, with 229 citations (Table 4). Men most cited the use of sauce too, with 307 use citations, followed by topical use, with 142 (Table 5).

Analyzing the body systems, women highlighted the treatment of respiratory system disorders with 328 citations, followed by undefined diseases or undefined pains, with 229 use citations (Table 7). Men most cited the body systems of undefined diseases or undefined pains, with 221 use citations, followed by digestive system disorders, with 159 (Table 6). Flu (32 citations), cicatrizing (27) and diarrhea (14) were the most cited

therapeutic indications by men (Table 8). By women, the main indications were flu (79 citations), cicatrizing (46), and general inflammation (27) (Table 8).

The species with a high importance relative value were *Myracrodruon urundeuva* Allemão and *Schinopsis brasiliensis* Engl. (Table 1). In relation to the percentage of citations for current use and potential use for therapeutic indications, the most cited were flu, with 13.05% of current use and 7.35% of potential use, and cicatrizing with 7.17% of current use and 6.25% of potential, followed by inflammation in general, with 4.23% of current use citations, without potential use citations (Table 10).

Discussion

Diversity and use of medicinal plants

We registered 51 species for medicinal purposes, but the amount of species was lower than were the results obtained in other ethnobotanical studies, which registered more species than we did (Brito and Senna-Valle, 2011; Oliveira et al., 2010; Silva and Proença, 2008). However, other studies show a lower amount than the one found in this study, such as in the study of Silva et al. (2012at), who recorded 44 species in an analysis of medicinal plants in the state of Minas Gerais. These differences can be explained by the fact that in our study, we registered only native woody species from Caatinga, disregarding the exotic and herbaceous species, and considering only the shrub and tree species. We can consider that the list of medicinal species registered in the communities studied is vast, given the fact that this category of plant diversity is not very high in the Caatinga ecosystem.

In some studies, the Fabaceae, Euphorbiaceae and Anacardiaceae families stood out, for example, in Odonne et al. (2013) study of the Peruvian Amazon. In this study, the Fabaceae family was the most prominent, with 23 species, confirming the prominence of this family in our study, which had 12 species recorded. However, in other ethnobotanical studies, the most prominent family was the Lamiaceae (Mosca and Loiola, 2009;

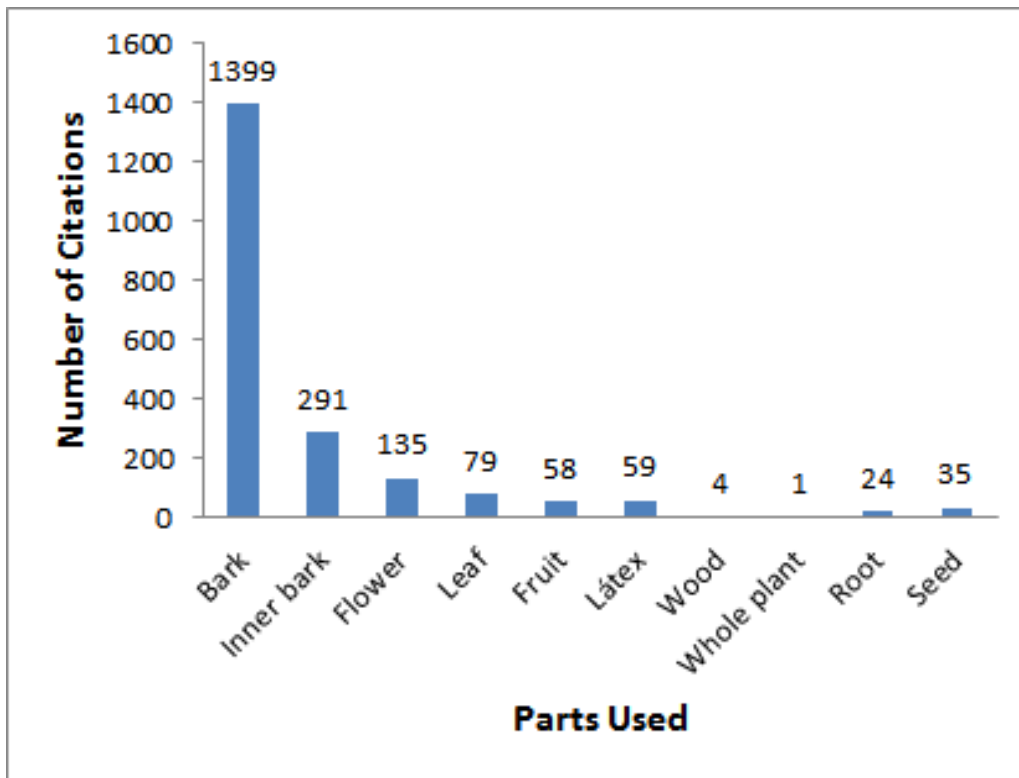


Figure 2. Used parts cited by men and women in the municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiarid Region of Paraíba State, Northeast Brazil.

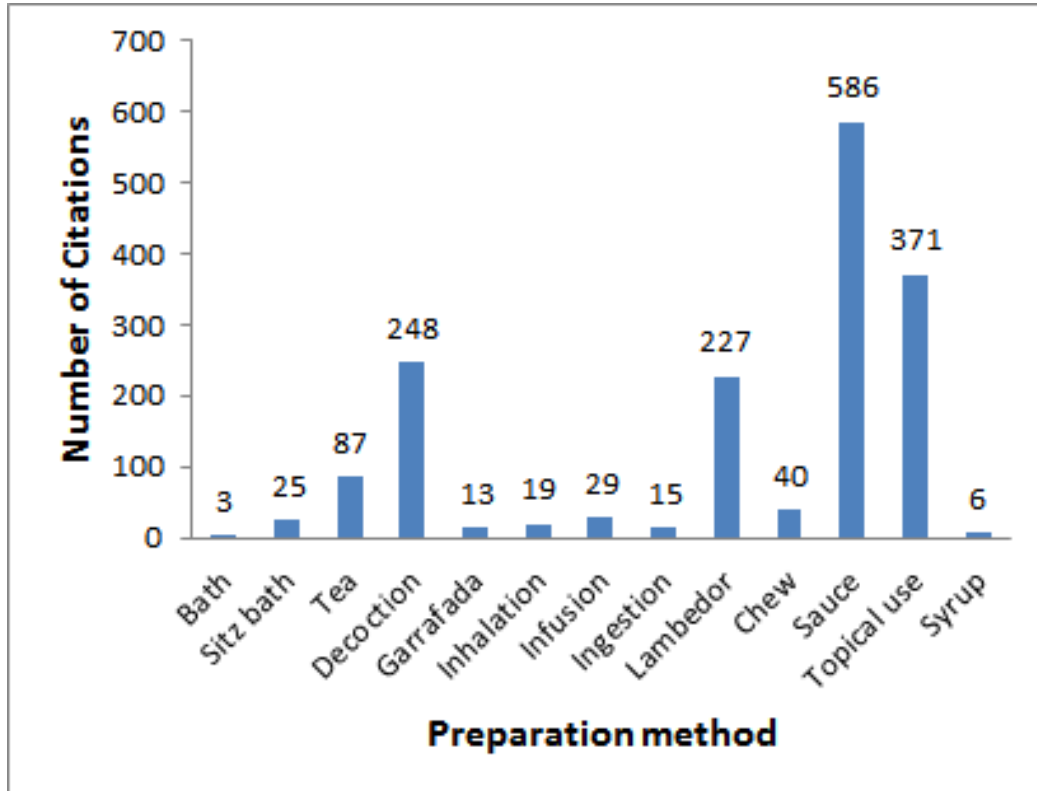


Figure 3. Preparation methods cited by men and women in the municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiarid Region of Paraíba State, Northeast Brazil.

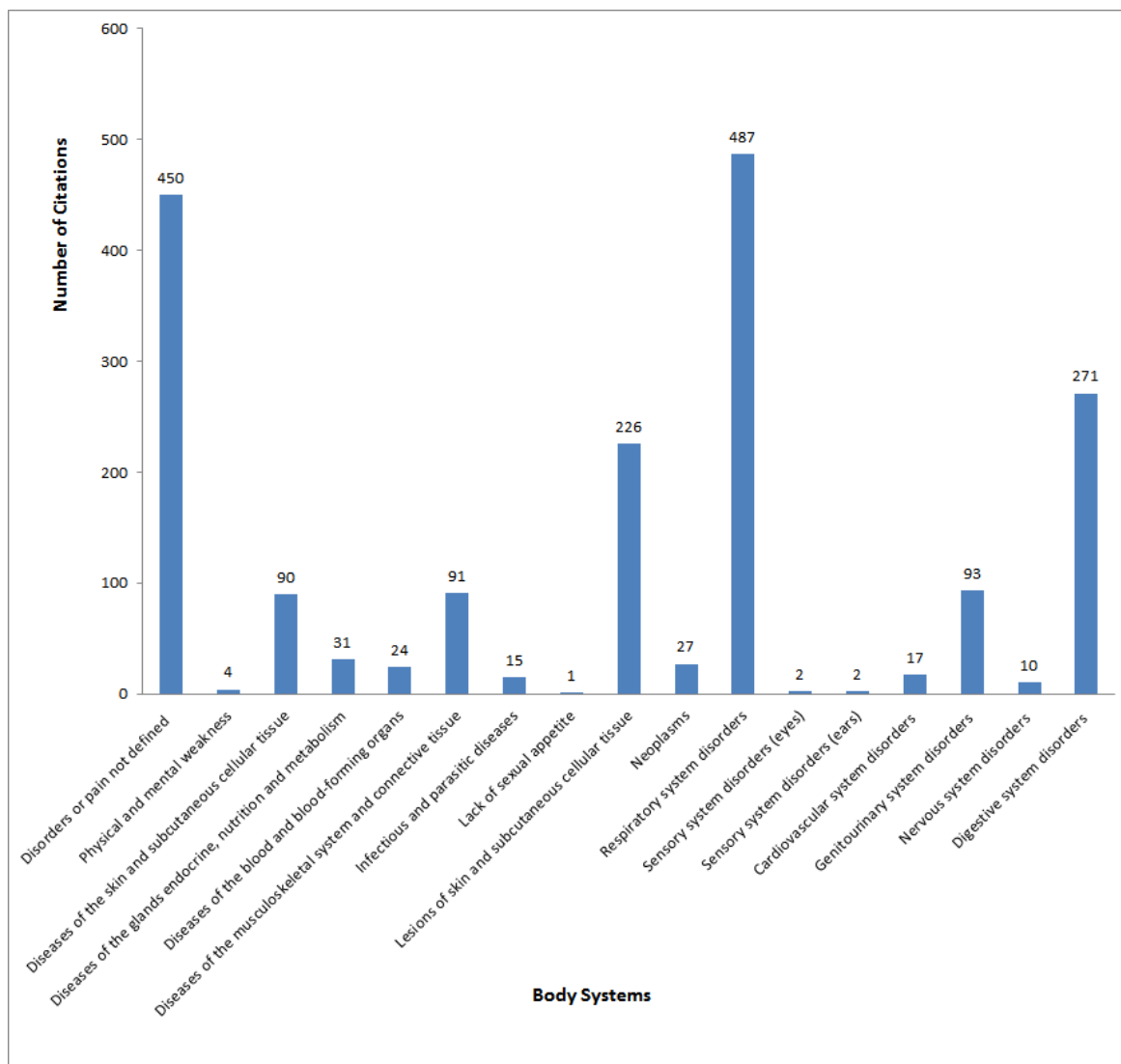


Figure 4. Body systems cited by men and women in the municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiárid Region of Paraíba State, Northeast Brazil.

Oliveira and Menini Neto, 2012), which was one of the most numerous families, but we did not identify it because in our study, we only included native shrubby and shrubby-arboreal species, given the fact that most of the individuals of this family are herbaceous sized and/or more common in yards and vegetable gardens (Paulino et al., 2011).

Myracrodruon urundeuva and *S. obtusifolium* were the species with the greatest number of citations by the communities due to their great medicinal potential. However, there were no citations for *S. obtusifolium* in the Community of

Pau D'Arco because this species does not exist in the local vegetation. Lopes et al. (2012), in their study in the Municipality of Itapetim, in Pernambuco State, and Sousa et al. (2012), in a study conducted in the Vale do Piancó, in Paraíba State, found results similar to the ones obtained in our study, regarding the importance of these species for therapeutic purposes; *S. obtusifolium* used as anti-inflammatory and *M. urundeuva* to treat inflammation in general, external injuries and cough. However, Sousa et al. (2012) reported the use of *M. urundeuva* for medicinal purposes as having the second highest number of

Table 1. Medicinal plant species and their relative importance for traditional populations in the municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the semi-arid region of Paraíba State, Northeast Brazil. Voucher: Jaime Coelho de Moraes Herbarium (EAN) of the Federal University of Paraíba (UFPB) at the Agricultural Sciences Center (CCA).

| Family/Species | Vernacular name | Voucher | Relative Importance | | | | |
|---|-----------------|---------|---------------------|------------|------------|---------|---------|
| | | | Lagoa | São Mamede | Itaporanga | Remígio | Solânea |
| Anacardiaceae | | | | | | | |
| <i>Myracrodruon urundeuva</i> Allemão | Aroeira | 17632 | 1.7 | 1.75 | 2 | 1.28 | 2 |
| <i>Schinopsis brasiliensis</i> Engl. | Baraúna | 17255 | | 0.22 | | 0.43 | 0.91 |
| <i>Spondias</i> sp. | Cajazeira | - | 0.19 | | | | |
| <i>Spondias tuberosa</i> Arruda | Umbuzeiro | 17556 | | 0.22 | | | 0.21 |
| Apocynaceae | | | | | | | |
| <i>Aspidosperma pyrifolium</i> Mart. | Pereiro | 17566 | 0.45 | 0.45 | | 0.21 | |
| Arecaceae | | | | | | | |
| <i>Syagrus oleracea</i> (Mart.) Becc | Côco catolé | 17567 | 0.56 | | | | |
| Bignoniaceae | | | | | | | |
| <i>Jocasanda mimosifolia</i> (Mart ex. DC) Standl. | Caroba | 17240 | 0.37 | | 1.34 | | |
| <i>Tabebuia</i> sp. | Pau d'arco | - | | 0.68 | | | 0.83 |
| Burseraceae | | | | | | | |
| <i>Commiphora leptophloeos</i> (Mart.) J. B. Gillet | Umburana | 17642 | 1.13 | 0.53 | 1.34 | 0.21 | 0.99 |
| Capparaceae | | | | | | | |
| <i>Caparis jacobinae</i> Moric. Ex Eichlee | Icó | - | | | | 0.63 | |
| <i>Crateva trapia</i> L. | Trapiá | - | 0.26 | | | | |
| <i>Cynophalla flexuosa</i> (L.) J. Presl. | Feijão Brabo | 17583 | | | | 0.21 | 0.51 |
| Celastraceae | | | | | | | |
| <i>Mautenus reigida</i> Mart. | Bom-nome | 17615 | 0.56 | | | 0.63 | 1.46 |
| Chrysobalanaceae | | | | | | | |
| <i>Licania rigida</i> Benth. | Oiticica | 17634 | 0.26 | 0.31 | | | |
| Combretaceae | | | | | | | |
| <i>Combretum fruticosum</i> | Mufumbo | 17587 | 0.98 | 1.29 | 1.34 | | |
| <i>Thiloa glaucocarpa</i> (Mart.) Eichlee | João mole | - | 0.87 | | | | 0.17 |
| Euphorbiaceae | | | | | | | |
| <i>Cnidocolus quercifolius</i> Pohl. | Favela | 17570 | | 1.83 | 0.66 | 0.5 | 0.37 |
| <i>Croton blanchetianus</i> Baill. | Marmeleiro | 17249 | 0.87 | 0.22 | 0.66 | 0.21 | 0.5 |
| <i>Croton rhamnifolius</i> Kunt. | Velame | 17558 | 0.75 | 0.22 | | 0.43 | 0.33 |
| <i>Jatropha mollissima</i> (Pohl.) Baill. | Pinhão brabo | 17578 | 0.26 | | | 0.28 | 0.66 |
| <i>Jatropha ribifolia</i> (Pohl.) Baill. | Pinhão manso | 17257 | | | | | 0.66 |

Table 1. Continued.

| Family/Species | Vernacular name | Voucher | Relative Importance | | | | |
|--|-----------------|---------|---------------------|------------|------------|---------|---------|
| | | | Lagoa | São Mamede | Itaporanga | Remígio | Solânea |
| Fabaceae | | | | | | | |
| <i>Amburana cearensis</i> (Allemão) A. C. Sm. | Cumarú | 17638 | 0.68 | 0.85 | 0.66 | 1.35 | 0.94 |
| <i>Anadenanthera colubrina</i> (Vell) Brenan | Angico | 17630 | 0.64 | 0.9 | 0.66 | 0.21 | 1.19 |
| <i>Bauhinia cheilanta</i> (Bong.) Steud. | Mororó | 17648 | 0.64 | | 0.66 | 0.92 | 0.37 |
| <i>Bauhinia pentandra</i> | Mororó | 17854 | | 0.99 | | | |
| <i>Erythrina velutina</i> Wild. | Mulungú | 17563 | | | | 0.5 | 0.66 |
| <i>Hymenoclea barbil</i> L. | Jatobá | 17582 | 0.82 | | | 0.92 | 0.58 |
| <i>Libidibia ferrea</i> (Mart. Ex Tul.) L. P. Queiroz | Jucá | 17256 | 1.28 | 1.85 | | 0.63 | 0.58 |
| <i>Mimosa tenuiflora</i> Wild. Poir | Jurema preta | 17626 | 1.44 | 1.43 | | 0.63 | 0.5 |
| <i>Piptadenia stipulaceae</i> (Benth.) Ducke. | Jurema branca | 17877 | 0.37 | 0.22 | | | |
| <i>Pithecellobium diversifolium</i> Benth. | Espinheiro | 17857 | | 0.22 | | | |
| <i>Poincianella pyramidallis</i> Tul. | Catingueira | 17251 | 0.98 | 0.53 | 1.34 | 1.5 | 1.19 |
| <i>Senegalia polyphylla</i> (D.C.) Britton & Rose | Unha de gato | 17876 | 0.19 | | | | |
| Malvaceae | | | | | | | |
| <i>Chorisia glaziovii</i> (Kuntze) E. Santos | Barriguda | - | | | | | 0.54 |
| <i>Guazuma ulmifolia</i> Lam. | Mutamba | 17842 | 0.19 | | | | |
| <i>Pseudobombax marginatum</i> (A. St.-Hill., Juss. & Cambess) A. Robyns | Imbiratã | 17562 | | 0.76 | | | |
| Meliaceae | | | | | | | |
| <i>Cedrela odorata</i> L. | Cedro | - | 0.19 | | | 0.43 | |
| Oleaceae | | | | | | | |
| <i>Ximenesia americana</i> L. | Ameixa | 17557 | 1.33 | 0.68 | 0.66 | 0.43 | 1.19 |
| Plumbaginaceae | | | | | | | |
| <i>Plumbago scandens</i> L. | Louro | 17860 | 0.19 | | | 0.43 | |
| Poligonaceae | | | | | | | |
| <i>Triplaris gardneriana</i> Wedd. | Cuaçu | 17871 | 0.37 | | | | |
| Rhamnaceae | | | | | | | |
| <i>Ziziphus joazeiro</i> Mart. | Juazeiro | 17580 | 1.21 | 1.85 | 1 | 0.77 | 0.66 |
| Rubiaceae | | | | | | | |
| <i>Coutarea hexandra</i> (Jacq.) K. Schum | Quina quina | 17859 | 0.53 | | | | 0.17 |

Table 1. Continued.

| Family/Species | Vernacular name | Voucher | Relative Importance | | | | |
|---|-----------------|---------|---------------------|------------|------------|---------|---------|
| | | | Lagoa | São Mamede | Itaporanga | Remígio | Solânea |
| Fabaceae | | | | | | | |
| <i>Machaonia spinosa</i> Cham. & Schltdl. | Quebra faca | 17868 | 0.37 | | | | |
| <i>Tocoyena formosa</i> (Cham. & Schltdl.) K. Schum | Jenipapo brabo | 17645 | 0.19 | | 1.34 | | |
| Sapotaceae | | | | | | | |
| <i>Syderoxylum obtusifolium</i> (Roem & Schult.) T. D. Penn | Quixabeira | 17618 | 2 | 1.85 | | 2 | 1.38 |
| Indeterminates | | | | | | | |
| Indet. 1 | Jaramataia | | 1.48 | | | | |
| Indet. 2 | Balço | | 1.02 | | | | |
| Indet. 3 | Pau gonçalo | | 0.37 | | | | |
| Indet. 4 | Amorosa preta | | | | | | 0.17 |
| Indet. 5 | Mapirunga | | | | | | 0.74 |
| Indet. 6 | Louro | | | | | 0.43 | |

Table 2. Plant parts cited by women in the municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the semi-arid region of Paraíba State, Northeast Brazil.

| Plant parts | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|-------------|-------|------------|---------|------------|---------|-------|
| Bark | 276 | 19 | 444 | 91 | 64 | 894 |
| Inner bark | 27 | | 74 | 27 | 39 | 167 |
| Flower | 10 | 3 | 42 | 13 | 22 | 90 |
| Leaf | 25 | | 8 | 8 | 5 | 46 |
| Latex | 3 | | 15 | 6 | 3 | 27 |
| Fruit | 7 | | 1 | 13 | 5 | 26 |
| Root | 2 | | 1 | 5 | 2 | 10 |
| Seed | 5 | | 11 | 0 | 3 | 19 |

Table 3. Plant parts cited by men in the Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiarid Region of Paraíba State, Northeast Brazil.

| Plant parts | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|----------------|-------|------------|---------|------------|---------|-------|
| Bark | 147 | 20 | 224 | 68 | 46 | 505 |
| Inner bark | 6 | | 86 | 21 | 11 | 124 |
| Flower | 5 | 4 | 26 | 4 | 6 | 45 |
| Leaf | 16 | 1 | 7 | 8 | 1 | 33 |
| Fruit | 3 | | 18 | 9 | 2 | 32 |
| Latex | 1 | | 12 | 14 | 5 | 32 |
| Wood | 1 | | 1 | | 2 | 4 |
| Complete plant | | | | | 1 | 1 |
| Root | 8 | | 5 | | 1 | 14 |
| Seed | 2 | | 13 | | 1 | 16 |

citations; it was cited more for timber uses, such as construction, disagreeing with the results found in our study. Due to this species' timber and non-timber uses, it is

endangered because of its overuse and the inappropriate techniques used for obtaining its products, as Albuquerque and Andrade (2002b) demonstrated in their study.

Table 4. Preparation methods of medicines cited by women in the Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiarid Region of Paraíba State, Northeast Brazil.

| Preparation methods | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|---------------------|-------|------------|---------|------------|---------|-------|
| Bath | | | | | 3 | 3 |
| Sitz Bath | 14 | | 7 | | 1 | 22 |
| Tea | 45 | 4 | | | 5 | 54 |
| Decoction | 43 | | 73 | | 41 | 157 |
| “Garrafada” | | 2 | 4 | 1 | 6 | 13 |
| Inhalation | 7 | | 1 | | 4 | 12 |
| Infusion | 5 | | 8 | | 9 | 22 |
| Ingestion | 3 | | 5 | | | 8 |
| “Lambedor” | 46 | 1 | 73 | | 30 | 150 |
| Chew | 5 | | 8 | | 1 | 14 |
| Sauce | 92 | 6 | 150 | 3 | 28 | 279 |
| Topical use | 95 | 7 | 110 | 1 | 16 | 229 |
| Syrup | | 3 | 2 | | | 5 |

Table 5. Preparation methods of medicines cited by men in the Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiarid Region of Paraíba State, Northeast Brazil.

| Preparation methods | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|---------------------|-------|------------|---------|------------|---------|-------|
| Bath | | | | | | |
| Sitz Bath | | | 1 | | 2 | 3 |
| Tea | 23 | 6 | | 1 | 3 | 33 |
| Decoction | 17 | | 61 | | 13 | 91 |
| “Garrafada” | | | | | | |
| Inhalation | 4 | | 1 | | 2 | 7 |
| Infusion | 3 | | 4 | | | 7 |
| Ingestion | 2 | | 3 | 2 | | 7 |
| “Lambedor” | 18 | 1 | 48 | 1 | 9 | 77 |
| Chew | 8 | | 18 | | | 26 |
| Sauce | 65 | 9 | 190 | 13 | 30 | 307 |
| Topical use | 48 | 9 | 65 | 1 | 19 | 142 |
| Syrup | 1 | | | | | 1 |

Pedrosa et al. (2012) conducted a study with *S. obtusifolium* in three regions of the semiarid depression in Paraíba, Northeast Brazil, and this species was more prominently used for medicinal purposes, thus confirming the results we obtained in the communities studied. Because of its overuse, *S. obtusifolium* was included in the vulnerable category of endangered species through the Environment Ministry's Ordinance no. 37-N, on April 3, 1992 (IBAMA, 1992). It received the attention of conservationists and semiarid populations who changed their habits, contributing to the removal of this species from the list of endangered species, according to the Environment Ministry's Normative Instruction no. 6, of September, 2008.

Used plant parts and methods of preparation

The part of the plant that was used most often among men and women were the bark (most cited) and inner bark. A similar result was found in a study in the Municipality of Caicó, Rio Grande do Norte State (Roque et al., 2010), where the bark was the most prominently used part of the plant, too. In other studies, the leaves were registered as the most used part, followed by the bark and roots (Pinto et al., 2006; Albertasse et al., 2010; Nascimento and Conceição, 2011).

These results show the importance of the bark for medicine preparation in folk medicine, by the fact it is a resource

Table 6. Body systems cited by men in the Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semi-arid Region of Paraíba State, Northeast Brazil.

| Body systems | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|---|-------|------------|---------|------------|---------|-------|
| Undefined diseases or undefined pains | 33 | 2 | 146 | 21 | 19 | 221 |
| Skin and subcutaneous tissue diseases | 18 | | 6 | 7 | 1 | 32 |
| Endocrine, nutrition and metabolism diseases | 4 | | 4 | | 1 | 9 |
| Blood and blood-forming organs diseases | 3 | | 12 | | 2 | 17 |
| Musculoskeletal system and connective tissue diseases | 4 | | 39 | | 5 | 48 |
| Infectious and parasitic diseases | | | | | 1 | 1 |
| Skin and subcutaneous tissue lesions | 27 | 9 | 22 | 5 | 20 | 83 |
| Neoplasms | 3 | | 7 | | | 10 |
| Respiratory system disorders | 49 | 9 | 85 | | 16 | 159 |
| Sensory system disorders (eyes) | 1 | | | | | 1 |
| Sensory system disorders (ears) | | | 1 | | | 1 |
| Cardiovascular system disorders | 4 | 2 | | | | 6 |
| Genitourinary system disorders | 7 | | 7 | | | 14 |
| Nervous system disorders | | | 3 | | | 3 |
| Digestive system disorders | 36 | 3 | 60 | | 12 | 111 |

Table 7. Body systems cited by women in the Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semi-arid Region of Paraíba State, Northeast Brazil.

| Body systems | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|---|-------|------------|---------|------------|---------|-------|
| Undefined diseases or undefined pains | 76 | 1 | 106 | 16 | 30 | 229 |
| Physical and mental weakness | | | 3 | | 1 | 4 |
| Skin and subcutaneous tissue diseases | 22 | | 18 | 17 | 1 | 58 |
| Endocrine, nutrition and metabolism diseases | 9 | | 5 | 7 | 1 | 22 |
| Blood and blood-forming organs diseases | | | 3 | | 4 | 7 |
| Musculoskeletal system and connective tissue diseases | 6 | | 22 | 7 | 8 | 43 |
| Infectious and parasitic diseases | 3 | | 6 | 4 | 1 | 14 |
| Sexual inappetency | | | | 1 | | 1 |
| Skin and subcutaneous tissue lesions | 46 | 8 | 45 | 29 | 15 | 143 |
| Neoplasms | 1 | | | 12 | 4 | 17 |
| Respiratory system disorders | 107 | 12 | 137 | 26 | 46 | 328 |
| Sensory system disorders (eyes) | | | | 1 | | 1 |
| Sensory system disorders (ears) | | | 1 | | | 1 |
| Cardiovascular system disorders | 3 | | 6 | 2 | | 11 |
| Genitourinary system disorders | 32 | | 21 | 21 | 5 | 79 |
| Nervous system disorders | | | 4 | | 3 | 7 |
| Digestive system disorders | 48 | 1 | 67 | 20 | 24 | 160 |

Table 8. Therapeutic indications cited by men in the municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the semi-arid region of Paraíba State, Northeast Brazil.

| Diseases | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|---|-------|------------|---------|------------|---------|-------|
| Allergy | 1 | | | | | 1 |
| Antiophidic | 1 | | 3 | 8 | | 12 |
| Stroke | | | 1 | | | 1 |
| Heartburn | 5 | | | | | 5 |
| Bronchitis | 3 | | 3 | | 2 | 8 |
| Soothing | | | 2 | | | 2 |
| Cancer | 1 | | | 7 | | 8 |
| Cicatrizing | 27 | 9 | 22 | 29 | 15 | 102 |
| Tooth cicatrizing | 3 | | | 1 | | 4 |
| Cirrhosis | 2 | | | | | 2 |
| Itching | 2 | | 2 | | 1 | 5 |
| Cholesterol | 1 | | 3 | | 1 | 5 |
| Cramps | | | 1 | | | 1 |
| Conjunctivitis | | | | 1 | | 1 |
| Whooping cough | | | | | 1 | 1 |
| Diabetes | 3 | | 1 | 5 | | 9 |
| Diarrhea | 14 | 3 | 30 | 9 | 7 | 63 |
| Skin disease | 4 | | | | | 4 |
| Headache | 1 | | 6 | | | 7 |
| Toothache | 3 | | 20 | | 4 | 27 |
| Earache | | | 1 | | | 1 |
| Pain in general | 2 | 1 | 14 | | | 17 |
| Muscle pain | 1 | | | | | 1 |
| Spine pain | 3 | | 34 | 8 | 3 | 48 |
| Leg pain | | | 1 | | | 1 |
| Knee pain | | | | | 2 | 2 |
| Stop the bleeding | 3 | 1 | 7 | 4 | | 15 |
| Fever | 1 | | 1 | 2 | | 4 |
| Injury | | | 1 | | 3 | 4 |
| Gastritis | 4 | | 6 | 5 | | 15 |
| Flu | 32 | 5 | 55 | 6 | 4 | 109 |
| Hepatitis | 1 | | | | | 1 |
| Hernia | | | 3 | 1 | | 4 |
| “Impingem” (superficial skin mycoses) | | | | 1 | | 1 |
| General infection | | | 7 | | | 7 |
| Urinary infection | | | | 1 | | 1 |
| General inflammation | 12 | 1 | 91 | 9 | 18 | 131 |
| Sore throat | 12 | | 1 | 2 | | 15 |
| Gum inflammation | 2 | | | | | 2 |
| Inflammation in the leg | | | | | 1 | 1 |
| Tooth inflammation | 1 | | | | 6 | 7 |
| Ovary inflammation | | | | 1 | | 1 |
| Malaise | 2 | | | | | 2 |
| Blow (mechanical shock) | 11 | | 18 | 1 | | 30 |
| Blow in the testicles | | | 1 | | | 1 |

Table 8. Continued.

| Diseases | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|---|-------|------------|---------|------------|---------|-------|
| Goitre | | | | 1 | | 1 |
| “Espinheira-caída” (pain in the sternum region/ stickleback) | | | 1 | | | 1 |
| Louse | 1 | | | | | 1 |
| Intestinal problems | 3 | | | | | 3 |
| Blood problems | 1 | 1 | | | | 2 |
| Uterus problems | | | 3 | 4 | | 7 |
| Kidney problems | 3 | | 12 | 5 | 2 | 22 |
| Prostate | 4 | | 2 | 1 | | 7 |
| Burns | | | | | 1 | 1 |
| Remove film that forms on the eye | 1 | | | | | 1 |
| Remove skin sign | 1 | | | | | 1 |
| Rheumatism | 3 | | 5 | | | 8 |
| Seborrhea | 7 | | 3 | 6 | | 16 |
| Sinusitis | 4 | | | | 1 | 5 |
| Cough | 9 | 4 | 27 | 6 | 9 | 55 |
| Ulcer | | | 3 | | | 3 |
| Urethra | | | 1 | | | 1 |

available throughout the year in the Caatinga. Because of the rainfall dynamics, the bark is the only native medicinal resource available during most of the year, so its use prominence is common, as we can see in ethnobotanical studies conducted in this ecosystem. However, bark overuse is an aggravating factor for the species because the collection technique is highly aggressive, threatening the species, especially native ones (Williams et al., 2000; Almeida and Albuquerque, 2002; Gomes et al., 2008; Alves et al., 2012; Gomes and Bandeira, 2012).

The most used methods of preparation were sauce, topical and lambedor. Lucena et al. (2011), in rural communities in the semi-arid region of Brazil, also registered sauce as the most frequent form of preparation. Other authors mention the predominance of tea, lambedor, topical use and decoction as the most used methods of preparation (Lopes et al., 2012; Mosca and Loiola, 2009; Santos et al., 2008), which were not verified in the communities studied here.

Therapeutic uses of the plants

In our study, women were more prominent regarding the knowledge and use

of medicinal plants in relation to men. Gomes et al. (2008) found a similar result, in a Quilombola community in the Raso da Catarina (Bahia, Northeast Brazil), in which women stood out for knowing more about the medicinal use of plants. In the study carried out by Pedrosa et al. (2012), men had greater prominence in area of medical use, and women in the fuel category, but it should be noted that this category is related to food preparation in the home. This finding for men in this category is not unique, because in most cases, men collect the bark in vegetation areas to make the drugs. According to Lucena et al. (2013), knowledge of men and women may follow different patterns for plant resources, which, depending on where the communities are located, the knowledge may be similar or different.

We verified that 17 species of medicinal plants had great versatility regarding their uses with $RI > 1$, and *S. obtusifolium* and *M. urundeuva* with $RI = 2$, with the maximum value obtained in relative importance. Other studies with this approach show the high versatility of these species, which are used for medicinal purposes (Almeida and Albuquerque, 2002; Paulino et al., 2011). In a study Oliveira et

Table 9. Therapeutic indications cited by women in the Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiarid Region of Paraíba State, Northeast Brazil.

| Diseases | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|---|-------|------------|---------|------------|---------|-------|
| Acne | | | | 1 | | 1 |
| Amoeba | | | 6 | | | 6 |
| Soften the joints | | | | | 1 | 1 |
| Anemia | 2 | | | | | 2 |
| Antibiotic | | | 1 | | | 1 |
| Antiophidic | 2 | | 2 | 1 | | 5 |
| Increase libido | | | | 1 | | 1 |
| Stroke | | | 1 | | | 1 |
| Heartburn | 1 | | | 1 | | 2 |
| Bronchitis | 3 | | 1 | 2 | 2 | 8 |
| Soothing | | | 3 | | 1 | 4 |
| Cancer | 1 | | | 12 | 4 | 17 |
| Tiredness | 2 | | | | | 2 |
| Chickenpox | 1 | | | 1 | | 2 |
| Cicatrizing | 46 | 8 | 45 | 19 | 7 | 125 |
| Tooth cicatrizing | 6 | | | | | 6 |
| Itching | 2 | | 1 | 1 | | 4 |
| Cholesterol | 1 | | 3 | 2 | | 6 |
| Cramp | | | 1 | | 2 | 3 |
| Nasal congestion | | | | | 1 | 1 |
| Whooping cough | | | | | 1 | 1 |
| Diabetes | 6 | | 2 | 5 | 1 | 14 |
| Diarrhea | 16 | 1 | 33 | 6 | 12 | 68 |
| Headache | 5 | | 1 | | | 6 |
| Toothache | 12 | | 24 | | 6 | 42 |
| Pain in general | 6 | | 5 | | 7 | 18 |
| Spine pain | 5 | | 20 | 5 | 4 | 34 |
| Breast pain | | | | 1 | | 1 |
| Joint pain | | | | | 1 | 1 |
| Liver pain | 2 | | | | | 2 |
| Hip pain | 1 | | | | | 1 |
| Nausea in pregnancy | | | 2 | | | 2 |
| Stop the bleeding | 3 | | 6 | 1 | | 10 |
| Lack of appetite | | | | | 1 | 1 |
| Fever | 4 | | 1 | 1 | | 6 |
| Injury | | | 2 | | 7 | 9 |
| Nerve weakness | | | | | 2 | 2 |
| Gases | | | 1 | | 1 | 2 |
| Gastritis | 4 | | 5 | | | 9 |
| Flu | 79 | 5 | 79 | 16 | 6 | 185 |
| Hemorrhoids | | | | 1 | | 1 |
| Hernia | | | 1 | | | 1 |
| “Impingem” (superficial skin mycoses) | | | | 2 | | 2 |
| General infection | | | 4 | | | 4 |
| Urethra infection | | | 2 | | | 2 |
| Urinary infection | | | 2 | 3 | | 5 |
| Vaginal infection | | | 1 | | | 1 |
| General inflammation | 27 | 1 | 82 | 13 | 19 | 142 |
| Sore throat | 11 | — | 3 | 8 | 2 | 24 |
| Gum inflammation | 2 | | | | 1 | 3 |
| Urethra inflammation | 1 | | | | 1 | 2 |
| Tooth inflammation | 1 | | | | 1 | 2 |

Table 9. Continued.

| Diseases | Lagoa | Itaporanga | Solânea | São Mamede | Remígio | Total |
|--|-------|------------|---------|------------|---------|-------|
| Stomach inflammation | 2 | | | | | 2 |
| Inflammation in injuries | 1 | | | | | 1 |
| Intestinal inflammation | | | | 1 | | 1 |
| Ovary inflammation | 8 | | 5 | 1 | | 14 |
| Uterus inflammation | 15 | | 10 | 16 | 1 | 42 |
| Insomnia | | | 3 | | | 3 |
| Labyrinthitis | | | 1 | | | 1 |
| Indigestion | | | | 1 | | 1 |
| Malaise | 7 | | | | 1 | 8 |
| Kill bacteria | | | 1 | | | 1 |
| Mycosis | | | 1 | | | 1 |
| Myoma | | | | | 1 | 1 |
| Eyes | | | | 1 | | 1 |
| Blow (mechanical shock) | 22 | | 2 | | 3 | 27 |
| “Panos branco” (Pityriasis versicolor) | | | | 1 | | 1 |
| “Pano preto” (Chloasma) | | | | 1 | | 1 |
| Goitre | | | | 1 | | 1 |
| Louse | 3 | | | 2 | | 5 |
| Pyorrhea | 3 | | | | | 3 |
| Pneumonia | | | 1 | | 2 | 3 |
| Pre-childbirth | | | 1 | | | 1 |
| Constipation | | | | | 1 | 1 |
| Intestinal problems | 1 | | | | | 1 |
| Kidney problems | 8 | | 3 | 1 | 4 | 16 |
| Burns | | | 1 | | | 1 |
| Rheumatism | 3 | | 2 | 2 | 2 | 9 |
| Seborrhea | 16 | | 13 | 11 | | 40 |
| Sinusites | 9 | | 2 | 1 | 3 | 15 |
| Cough | 14 | 7 | 46 | 6 | 30 | 103 |
| Tuberculosis | | | 1 | | 2 | 3 |
| Ulcer | 1 | | 1 | | 1 | 3 |

al. (2010) carried out, in rural communities in Oeiras, a Semiarid Region of Piauí, *M. urundeuva* had $RI < 2$. Use of plants with $IR = 2$ has also been reported in other regions of Brazil, as exemplified by the study of Brito and Senna, (2011) conducted in the Municipality of Paraty, State of Rio de Janeiro, which presented the *Lippia alba* (Mill.) N. E. Br. (erva-cidreira) with $RI = 2$. This is an exotic species, easy to grow, and is widely used in traditional medicine, especially as tea.

There were several instructions by the communities for using plant species, however, that most prominent among men and women were: general inflammation, cicatrizing, flu and cough. Several authors presented in their results the prevalence of

these therapeutic indications (Pasa et al., 2005; Alves and Nascimento, 2010; Lucena et al., 2011; Souza et al., 2011). However, there is still a lack of studies related to the therapeutic indications, taking into account current and potential use citations, requiring further studies to know the real value of these therapeutic indications, both in the Caatinga region and in other regions.

The main medical categories, according to the number of citation species, were respiratory system disorders, undefined diseases or undefined pains, digestive system disorders, skin and subcutaneous tissue lesions, as well as the genitourinary system disorders that were the most prominent only among women, due the fact some species are used to cure

Table 10. Current (Cur) and potential (Pot) use citations of therapeutic indications in the Municipalities of Itaporanga, Lagoa, Remígio, São Mamede and Solânea, in the Semiárid Region of Paraíba State, Northeast Brazil.

| Therapeutic indications | Remígio | | Itaporanga | | Lagoa | | São Mamede | | Solânea | |
|---------------------------------------|---------|-------|------------|--------|--------|-------|------------|-------|---------|-------|
| | Cur | Pot | Cur | Pot | Cur | Pot | Cur | Pot | Cur | Pot |
| Acne | | | | | | | 0.35% | | | |
| Thinning the blood | | | | 2.13% | | | | | | |
| Amoeba | | | | | | | | | 0.64% | 0.13% |
| Soften the joints | | 0.45% | | | | | | | | |
| Anemia | | | | | 0.18% | 0.18% | | | | |
| Antibiotic | | | | | | | | | 0.13% | |
| Increase libido | | | | | | | | 0.35% | | |
| Stroke | | | | | | | | | 0.26% | |
| Heartburn | | | | | 0.37% | 0.74% | 0.35% | | | |
| Bronchitis | 1.36% | 0.45% | | | 0.74% | 0.37% | 0.35% | 0.35% | 0.51% | |
| Soothing | 0.45% | | | | | | | | 0.13% | 0.38% |
| Cancer | 0.45% | 0.91% | | | | 0.55% | 2.44% | 4.53% | | |
| Skin câncer | | 0.45% | | | | | | | | |
| Tiredness | | | | | 0.18% | 0.18% | | | | |
| Dandruff | 0.45% | 0.45% | | | | 0.18% | | | | |
| Chickenpox | | | | | 0.18% | | 0.35% | | | |
| Catarrh | 0.91% | | 12.77% | 23.40% | | | | | | |
| Cicatrizing | 7.73% | 2.73% | | | 7.17% | 6.25% | 15.68% | 4.53% | 6.77% | 1.02% |
| Tooth cicatrizing | | | | | | | 0.35% | | | |
| Cicatrizing of extracted tooth | | | | | 1.29% | 0.37% | | | | |
| Cirrhosis | | | | | | 0.37% | | | | |
| Itching | 0.45% | | | | | 0.74% | | 0.35% | 0.26% | 0.13% |
| Cholesterol | 0.45% | | | | | 0.37% | | 0.70% | 0.64% | 0.13% |
| Cramp | 0.91% | | | | | | | | | |
| Menstrual cramp | | | | | | | | | 0.26% | |
| Nasal congestion | 0.45% | | | | | | | | | |
| Conjunctivitis | | | | | | | | 0.35% | | |
| Whooping cough | 0.91% | | | | | | | | | |
| Inflamed tooth | 0.45% | | | | | | | | | |
| Diabetes | 0.45% | | 2.13% | 6.38% | | 1.65% | 0.70% | 2.79% | 0.26% | 0.13% |
| Diarrhea | | | | | 3.49% | 2.02% | 4.18% | 1.05% | 5.87% | 1.92% |
| Skin disease | | | | | | 0.74% | | | | |
| Belly ache | 7.27% | 1.36% | | | | | | | | |
| Headache | | | | | 0.74% | 0.37% | | | 0.77% | 0.13% |
| Toothache | 2.27% | 2.27% | | | 0.74% | 2.02% | | | 4.09% | 1.40% |
| Earache | | | | | | | | | 0.13% | |
| Pain do to blow | 0.45% | 0.45% | | 2.13% | | | | | | |
| Pain in general | 0.91% | 2.27% | | | 0.37% | 1.10% | | | 2.04% | 0.38% |
| Muscle pain | | | | | | 0.18% | | | | |
| Spine pain | 1.36% | 1.36% | | | 0.74% | 0.74% | 3.48% | 1.05% | 5.49% | 1.40% |
| Joint pain | 0.45% | | | | | | | | | |
| Liver pain | | | | | 0.18% | 0.18% | | | | |
| Knee pain | 0.91% | | 2.13% | | | | | | | |
| Hip pain | | | | | | 0.18% | | | | |
| Nausea in pregnancy | | | | | | | | | 0.26% | |
| Stanch blood | | | | | 0.74% | 0.37% | 1.74% | | 1.28% | 0.26% |
| Prevent câncer | | | | | | 0.18% | | | | |
| Expectorante | | | | | | | 0.35% | | 1.15% | |
| Lack of appetite | | 0.45% | | | | | | | | |
| Fever | | | | | 0.55% | 0.37% | 0.70% | 0.35% | 0.26% | |
| Injury | 0.45% | | | | | | | | | |
| Injury in general | 1.36% | 0.91% | | | | | | | | |
| Head injury | 0.91% | 0.91% | | | | | | | | |
| Gases | 0.45% | | | | | | | | 0.13% | |
| Gastrites | | | | | 0.37% | 1.10% | 2.09% | 0.70% | 1.02% | 0.13% |
| Inflamed gums | 0.45% | | 14.89% | 6.38% | | | | | | |
| Flu | 4.55% | | 2.13% | 2.13% | 13.05% | 7.35% | 5.23% | 2.44% | 14.56% | 1.53% |
| Hemorrhoids | | | | | | | | 0.35% | | |
| Hepatites | | | | | | 0.18% | | | | |
| Hernia | | | | | | | 0.35% | | 0.26% | 0.26% |
| “Impingem” (superficial skin mycoses) | | | | | | | 1.05% | | | |
| Infection in injuries | | | | | | | | | 0.38% | |
| Infection in general | | | | | | | | | 1.15% | 0.26% |
| Urinary infection | | | | | | | 1.05% | 0.35% | 0.26% | |

Table 10. Continued.

| Therapeutic indications | Remigio | | Itaporanga | | Lagoa | | São Mamede | | Solânea | |
|--|---------|-------|------------|-------|-------|-------|------------|-------|---------|-------|
| | Cur | Pot | Cur | Pot | Cur | Pot | Cur | Pot | Cur | Pot |
| Vaginal infection | | | | | | | | | | 0,13% |
| General inflammation | 10.91% | 5.91% | | | 4.23% | 2.94% | 5.57% | 2.09% | 19.28% | 2.30% |
| Sore throat | 0.91% | | | | 1.47% | 1.29% | 2.79% | 0.70% | 0.38% | |
| Gum inflammation | | | | | | 0.74% | | | | |
| Inflammation in the leg | 0.45% | | | | | | | | | |
| Urethra inflammation | | 0.45% | | | | 0.18% | | | 0.13% | |
| Tooth inflammation | | 0.45% | | | 0.18% | 0.18% | | | | |
| Stomach inflammation | | | | | 0.37% | | | | | |
| Inflammation in injuries | | | | | | 0.18% | | | | |
| Intestinal inflammation | | | | | | | | 0.35% | | |
| Ovary Inflammation | | | | | 0.37% | 1.10% | 0.35% | 0.35% | 0.51% | 0.13% |
| Uterus inflammation | | 0.45% | | | 1.29% | 1.47% | 2.79% | 4.18% | 1.02% | 0.51% |
| Insomnia | | | | | | | | | | 0.26% |
| Constipation | 0.45% | | | | | | | 0.35% | | |
| Labyrinthitis | | | | | | | | | | |
| Malaise | 0.45% | | | | 0.92% | 0.74% | | | | |
| Skin mark | | | | | | | | | 0.13% | |
| Kill louse | | | | | | 0.74% | | | | |
| Mycosis | | | | | | | | | 0.13% | |
| Myoma | 0.45% | | | | | | | | | |
| Snakebite | | | | | 0.18% | 0.37% | 0.35% | 2.79% | 0.13% | 0.51% |
| Nerves | 0.45% | 0.45% | | | | | | | | |
| Eyes | | | | | | | 0.35% | | | |
| Blow | | | | | 2.94% | | 0.35% | | 2.43% | 0.13% |
| Blow in the testicles | | | | | | | | | | |
| “Pano branco” (Pityriasis versicolor) | | | | | | | 0.35% | | | |
| “Pano preto” (Chloasma) | | | | | | | 0.35% | | | |
| Goitre | | | | | | | | 0.70% | | |
| “Espinhela-caída” (pain in the sternum region/stickleback) | | | | | | | | | 0.13% | |
| Louse | | | | | | | | 0.70% | | |
| Pyorrhea | | | | | | 0.55% | | | | |
| Pneumonia | 0.91% | | | | | | | | 0.13% | |
| Pre-childbirth | | | | | | | | | | |
| Kidney problem | 0.91% | 1.82% | | | 0.55% | 1.47% | 1.05% | 1.05% | 1.40% | 0.51% |
| Intestinal problems | | | | | | 0.74% | | | | |
| Blood problems | | | | | | 0.18% | | | | |
| Prostate | | | | | 0.37% | 0.37% | 0.35% | | | |
| Burn | | 0.45% | | | | | | | | |
| Remove film that forms on eye | | | | | 0.18% | | | | | |
| Remove skin sign | | | | | | | | | | |
| Rheumatism | 0.45% | 0.45% | | | | 0.18% | | | 0.38% | 0.51% |
| Allergic rhinitis | | | | | 0.37% | 0.74% | 0.70% | | | |
| Seborrhea | | | | | | 0.18% | | | 1.28% | 0.51% |
| Sinusites | 1.82% | | | | 0.55% | 3.49% | 2.44% | 3.48% | 0.13% | |
| Cough | 15.00% | 1.82% | 17.02% | 6.38% | 1.10% | 1.29% | 0.35% | | 6.77% | 0.77% |
| Tuberculosis | | 0.91% | | | 3.13% | 1.10% | 3.48% | 0.70% | 0.13% | |
| Ulcer | 0.45% | | | | | 0.18% | | | | 0.38% |

diseases in the uterus and menstrual cramps. These categories were also mentioned and stood out in the study carried out in the street fair of Caruaru, Agreste of Pernambuco State (Almeida and Albuquerque, 2002).

Studies conducted in Rondônia (Lima et al., 2011) and Mato Grosso

(Amorozo, 2002) also reported a higher number of citations for digestive, respiratory and genitourinary system disorders. Generally, the categories that are frequently mentioned for treatment with medicinal plants are digestive and respiratory system disorders; these two categories are widely cited by informants

(Pinto et al., 2006). These disorders are mentioned because most diseases that affect people are related to these health problems (Almeida and Albuquerque, 2002).

Conclusion

The results of this study show that the Municipalities of Itaporanga, Lagoa, Remígio, Solânea and São Mamede have a great diversity of medicinal species, and 17 of them showed a high Relative Importance value ($RI > 1$). More specific studies regarding these species are important in order to scientifically validate their medical effects in laboratory.

The preparation methods, plant parts and from where people use these medicinal plants as an alternative treatment for diseases, are important criteria for the poor population that has great difficulties in obtaining pharmaceutical medicines. Therefore, more studies are needed regarding current and potential uses of therapeutic indications to confirm the diseases most-often treated with medicinal plants by the population.

The most frequently cited species were *M. urundeuva* and *S. obtusifolium* because of its high level of versatility and medicinal potential. However, phyto-sociological studies are necessary to verify and confirm the use pressure on these species for medicinal purposes in the municipalities studied here.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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