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Ethnobotanical study of medicinal plants in Imperatriz, State of Maranhão, Northeastern Brazil

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ABSTRACT

The study of medicinal plants reveals locally important plant species often useful for the discovery of new drugs. The objective of this research was to conduct an ethnobotanical survey of medicinal plants used by the population of the Imperatriz city, State of Maranhão, Northeastern Brazil. Two hundred and five interviews were conducted, resulting in the collection of 60 plant species from 31 plant families. The highest number of species belongs to Fabaceae, followed by Lamiaceae, Asteraceae and Euphorbiaceae. The most reported species were *Chenopodium ambrosioides, Myracrodruon urundeuva, Lippia alba,* and *Plectranthus barbatus.* The main plant parts used were leaves (63.3%), bark (16.7%), fruits (6.7%), roots (6.7%), seeds (3.3), stems (1.7%) and latex (1.7%). Major administration routes were by oral (81.7%) or nasal via (1.6%) and topical application (16.7%) The plants were used to mitigate various health problems including pain, asthma, hypertension, gastritis, inflammation, influenza, and tuberculosis. The collected data shows that local population uses medicinal plants for treatment of several diseases and this study can serve as a basis for future chemical and pharmacological investigation, which can lead to the discovery of new therapeutic agents.

KEYWORDS: Traditional knowledge; natural products, disease treatment, ethnopharmacology.

Estudo etnobotânico de plantas medicinais em Imperatriz, Estado do Maranhão, Nordeste do Brasil.

RESUMO

O estudo de plantas medicinais são em geral significativos em revelar espécies de plantas localmente importantes, principalmente para a descoberta de fármacos. O objetivo desta pesquisa foi realizar um levantamento etnobotânico das plantas medicinais utilizadas pela população da cidade de Imperatriz no estado do Maranhão, Nordeste do Brasil. 205 entrevistas foram realizadas resultando na coleção de 60 espécies de 31 famílias de plantas. Fabaceae teve o maior número de espécies, seguido por Lamiaceae, Asteraceae e Euphorbiaceae. As espécies mais utilizadas foram *Chenopodium ambrosioides*, *Myracrodruon urundeuva*, *Lippia alba* e *Plectranthus barbatus*. As principais partes foram as folhas (63,3%), cascas (16,7%), frutos (6,7%), raízes (6,7%), sementes (3,3%), caule (1,7%) e látex (1,7%). As vias de administração mais frequentes foram oral (81,7%), tópica (16,7%) e nasal (1,6%). As plantas são utilizadas para diversos problemas de saúde como dores em geral, asma, hipertensão, gastrite, inflamação, gripe e tuberculose. Os dados mostram que população local utiliza plantas medicinais para tratamento de várias doenças e este estudo pode servir de base para estudos químicos e farmacológicos futuros que levem ao descobrimento de novos agentes terapêuticos.

PALAVRAS-CHAVES: Conhecimento tradicional; produtos naturais; tratamento de doenças; etnofarmacologia.

INTRODUCTION

Brazil presents one of the largest plant biodiversity of the world, with several specific environments and flora types. Along the country, different ethnical groups have introduced the use of many plant species for various purposes, including medicinal (Costa and Mayworm 2011). One factor that favours the use of natural products in Brazil is the ethnobotanical knowledge of the population, which was formed by European and African colonists who brought information about medicinal plants to the local population (Oliveira *et al*. 2010). There is also indigenous population near Imperatriz city in Maranhão, which may also contributed to local customs in the use of medicinal plants.

Several ethnobotanical studies have been conducted in Brazil, seeking to find out about local folk medicine and forms of organization of this knowledge, and also in the search of plants that have effective therapeutic activity, therefore enabling the discovery of new drugs (Coutinho *et al*. 2002).

Maranhão, with an area of 331,936 km^2, is the eighth largest state in Brazil and the second largest in the Northeastern region of the country. Containing great cultural diversity, it is composed of 217 municipalities, with a population of 6,850,884. The two main cities of this State are São Luís, the capital city, followed by Imperatriz city (IBGE 2010).

In the state of Maranhão a varied biome is present formed by Caatinga, Amazon rain forest, floodplains, and mangroves and salt marshes, and the Cerrado vegetation going from the South to the Northeast occupying 40% of the vegetation cover (Silva *et al.* 2008). The city of Imperatriz (5°31'32" S and 47°26'35" W, 92 m above sea level) is located in the Southwest of the State of Maranhão (Figure 1), at 629.5 km from São Luís. The total municipality area is 1,368.987 km^2 with a population of 247,553 inhabitants, where 94.8% live in urban areas and 5.2 % in rural areas (IBGE 2010).

The objective of this research was to conduct an ethnobotanical survey of medicinal plants used by local population of Imperatriz city, State of Maranhão, Northeastern Brazil, providing baseline data for future pharmacological and phytochemical studies of more used plants.

MATERIALS AND METHODS

The study was submitted and approved by the Ethics Committee of the Federal University of Maranhão (Register No. 814 666). All participants were asked to sign the Informed Consent (IC) prior to data collection. The ethnobotanical study was performed between October 2014 and March 2015 in Imperatriz city, State of Maranhão, in order to investigate and identify plant species used as medicines by the local population.

The questionnaire registers the identification of the interviewed (age, educational background, sex, gender, and socioeconomic data), medicinal plants utilization, forms of use, plant parts, dosages, administration routes and disease indications. The choice of the houses for the interviews was made by chance. For each district, in different streets, five residences were selected, to reach different areas of the city.

A total of 205 questionnaires were applied, generally the respondents had plants at home or the plants were obtained nearby. The botanical material was collected according to the usual methods (Maciel *et al*. 2002), and deposited in the Ático Seabra Herbarium, Federal University of Maranhão. Taxonomic identification was made according to the vegetative

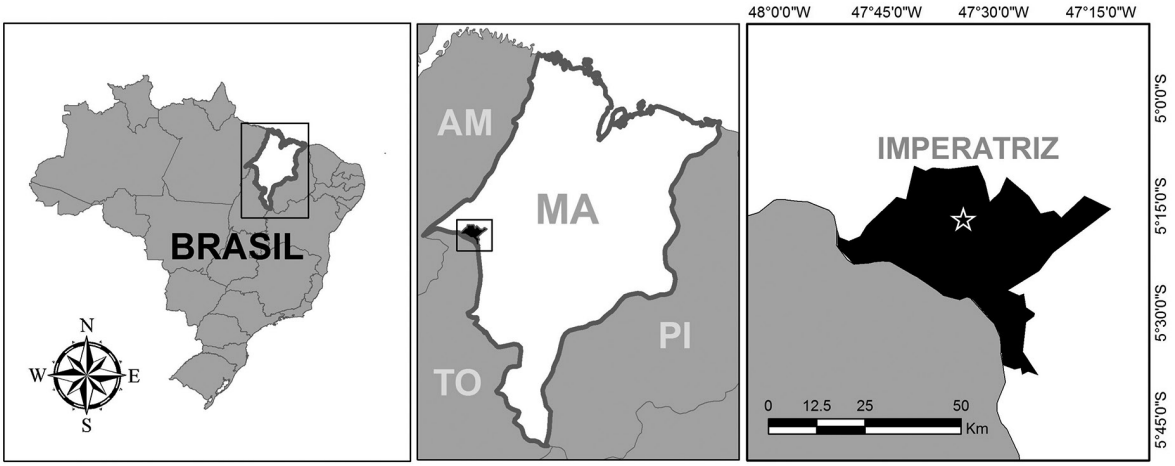

Figure 1. Study area and location map.

and reproductive morphology (Rego 1995; Coutinho *et al*. 2002; Monteles and Pinheiro 2007; Lorenzi and Matos 2008).

Data were analysed statistically, and described in simple percentages. The Epi Info Software (version 7.1.5) and Microsoft Excel® 2013 were used to present the results in figures and tables, considering the relative and absolute values that justify the prevalence of responses. For relative values, parts of medicinal plants used, route of administration, and medicinal plants more cited and for absolute values the number of informants was taken into account. Absolute frequency (AF) is the number of times the element appears in the sample and relative frequency, AR (%) = AF x 100/n, where n is the total number of events.

RESULTS

In the study the people interviewed were female (68%) and male (32%); the age group varied between 50 and 85 years (62%) and between 20 and 49 years (38%); the educational background was mainly fundamental and medium (48.3%), incomplete fundamental (25.2%), university level (14%) and illiterate (12.5%); 64.8% of interviewed have an income below U$ 300, 31.4% below US$ 300-500 and 3.8% above U$ 500 (at exchange rate of march 2015 where US$ 1.0 = R$ 3.18).

The current survey revealed the use of 60 species belonging to 31 families (Table 1), with Fabaceae having the highest number of species, followed by Lamiaceae, Asteraceae and Euphorbiaceae (Table 2). The most used species were: *Chenopodium ambrosioides* L., *Myracrodruon urundeuva* Fr. All., *Lippia alba* (Mill) N. E. Brown and *Plectranthus barbatus* Andrews.

The most frequently utilized plant part was the leaf (63.3%), followed by bark (16.7%), fruit (6.7%), root (6.7%), seed (3.3%), stem (1.7%) and latex, 1.7% (Figure 2). Administration routes were by infusion (81.7%), followed by topical application (16.7%) and nasal inhalation (1.6%), see Figure 3. The frequency of medicinal plant use varied, depending on the people's health status, with the most common frequency being three times a day. The most common medicinal plant uses were for illnesses involving inflammations; infectious diseases and fever and are shown in Table 1.

Table 1. Ethnobotanical information on the studied medicinal plants, in the state of Maranhão, Northeastern Brazil. (AF= Absolute frequency)

Scientific Names [Family]	Local Name	Used part/preparation	Disease/Use	Register	AF
Achyrocline satureioides (Lam.) DC [Asteraceae]	Macela	Leaf Infusion	Memory, stomach pain, diabetes, back pain, fever	1411	4
Ageratum conyzoides L. [Asteraceae]	Mentrasto	Leaf Infusion	Inflammation	1417	1
Aloe vera L. [Liliaceae]	Babosa	Leaf Infusion	Skin, burn, healing, hair loss, constipation, stomach problems	1426	6
Alpinia speciosa Schum or *A. zerumbeth* [Zingiberaceae]	Jardineira, Colônia	Leaf Infusion	Flu, blood pressure, asthma, healing, inflammation	1410	4
Anacardium occidentale Linn [Anacardiaceae]	Caju	Leaf Infusion	Healing, inflammation	1366	6
Anadenanthera peregrine L. Speg [Fabaceae]	Angico	Bark Decoction	Expectorant, flu, bronchitis, asthma, cough	1423	4
Annona squamosa L. [Annonaceae]	Ata	Leaf Infusion	Headache, ulcers, fever, vermifuge	1101	1
Arrabidaea chica Verlot [Bignoniaceae]	Pariri	Leaf Infusion	Anemia, hepatitis	1067	2
Bauhinia forficata Link [Fabaceae]	Mororó	Bark Decoction	Diabetes, kidney problems	1322	2
Bidens pilosa L. [Asteraceae]	Picão	Leaf Infusion	Hepatitis, Malaria	1285	3
Bowdichia virgilioides Kunth [Fabaceae]	Sucupira	Seed Decoction Syrup	Fever, inflammation, throat infection	1097	3
Capsicum frutescens L. [Solonaceae]	Pimenta Malagueta	Fruit Decoction	Headache, rheumatism, back pain	1384	1

Table 1. Continuation

Scientific Names [Family]	Local Name	Used part/preparation	Disease/Use	Register	AF
Caryocar coriaceaum Wittm [Caryocaraceae]	Piqui	Fruit Decoction	Flu, bronchitis, pneumonia	1325	5
Cassia occidentalis L. [Fabaceae]	Fedegoso	Root Decoction	Fever, indigestion	1397	1
Chenopodium ambrosioides L. [Chenopodiaceae]	Mastruz	Leaf Infusion	Inflammation, healing, constipation, flu	1148	12
Cissus sicyoides Linn [Vitaceae]	Insulina	Leaf Infusion	Diabetes	1251	4
Copaifera langsdorffii Desf. [Fabaceae]	Copaiba	Bark Decoction	Inflammation, healing	1400	3
Coriandrum sativum L. [Apiaceae]	Coentro	Leaf Infusion	Menstrual colic, headache, Inflammation	1418	2
Costus spicatus (Jacq.) [Zingiberaceae]	Cana de Macaco	Bark Decoction	Inflammation, kidney problems, haemorrhoids	1413	1
Eucalyptus globulus Labill [Myrtaceae]	Eucalipto	Leaf Infusion	Flu, diabetes pneumonia, bronchitis,	1412	5
Euphorbia tirucalli L. [Euphorbiaceae]	Cachorro Pelado	Stem Infusion	Healing	1045	1
Euterpe Oleracea Mart [Arecaceae]	Açaí	Seed Decoction	Memory, high pressure, unwell	1425	1
Genipa americana L. [Rubiaceae]	Genipapo	Bark Decoction	Inflammation, deregulate menstruation	1000	2
Gossypium arboreum L. [Malvaceae]	Algodão	Leaf Infusion	Inflammation, cough, bone healing, asthma	1115	7
Hancornia speciosa Gomes [Apocynaceae]	Mangaba	Bark Decoction	Healing, inflammation, stomach ulcers, stomach pain	1399	2
Jatropha curcas L. [Euphorbiaceae]	Pinhão manso	Leaf Infusion	Inflammation	1063	1
Julocroton triqueter (Lam) [Euphorbiaceae]	Velame	Leaf Infusion	Flu, cough, pneumonia, infection, headache, liver, rheumatism, blood depurative	1265	5
Kalanchoe pinnata Lam. [Crassulaceae]	Folha Santa	Leaf Infusion	Throat infection, stomach, healing, pneumonia, flu	1408	6
Lippia alba (Mill) N.E. Brown [Verbenaceae]	Erva Cidreira	Leaf Infusion	Antiespamodic, sedative Inflammation	1122	9
Luehea divaricata Mart. & Zucc [Malvaceae]	Açoita cavalo	Leaf Infusion	Inflammation, diabetes, irregular menstruation	1117	6
Mangifera indica L. [Anacardiaceae]	Manga	Leaf Infusion	Headache, ulcers, fevers.	1213	4
Mauritia flexuosa Mart. [Arecaceae]	Buriti	Fruit Infusion	Healing burns, snakebite, asthma	1394	3
Mentha arvensis L. [Lamiaceae]	Vique	Leaf Infusion	Nasal decongestant, flu, cough	1403	4
Mentha villosa L [Lamiaceae]	Hortelã	Leaf Infusion	Vermifuge, flu, pain, pneumonia	1424	6
Musa paradisiaca L [Musaceae]	Bananeira	Leaf Infusion	Gastritis, flu, bronchitis	1422	3
Myracrodruon urundeuva Fr. All. [Anacardiaceae]	Aroeira do Sertão	Bark Decoction	Inflammation, vaginal irregular menstruation sore throat, healing	1420	10

Table 1. Continuation

Scientific Names [Family]	Local Name	Used part/preparation	Disease/Use	Register	AF
Ocimum basilicum L. [Lamiaceae]	Manjericão	Leaf Infusion	Headache, healing, diuretic, cough, flu.	1008	6
Ocimum gratissimum L. [Lamiaceae]	Alfavaca	Leaf Infusion	Fever, flu, kidney problems	1372	3
Persea americana Mill. [Lauraceae]	Abacateiro	Leaf Infusion	Bladder pain, throat infection,	1398	1
Petiveria alliacea L. [Phytolaccaceae]	Guiné	Leaf Infusion	Fever, joint pain, memory	1162	2
Phyllanthus niruri L. [Euphorbiaceae]	Quebra Pedra	Leaf Infusion	Kidney problems	1396	1
Plathymenia reticulata Benth [Fabaceae]	Candeia	Bark Decoction	Inflammation, liver problems, bleeding	1414	4
Plectranthus barbatus Andrews [Lamiaceae]	Brazilian-Boldo	Leaf Infusion	Stomach ache, hepatitis, indigestion, liver problems	1406	9
Psidium guajava L. [Myrtaceae]	Goiabeira	Leaf Infusion	Diarrhea	1182	3
Rosmarinus officinalis L. [Lamiaceae]	Alecrim	Leaf Infusion	Flu, nasal decongestant, sinusitis, anxiety	1392	2
Ruta graveolens L. [Rutaceae]	Arruda	Leaf Infusion	Irregular menstruation, stomach ache, menstrual colic, ear pain	1055	4
Sambucus nigra L. [Caprifoliaceae]	Sabugueiro	Leaf Infusion	Asthma	1184	1
Scoparia dulcis L. [Scrophulariaceae]	Vassourinha	Bark Decoction	Inflammation, diuretic and urinary tract infection	1409	1
Solanum paniculatum L. [Solonaceae]	Jurubeba	Leaf Infusion	Tuberculosis, hepatitis, anti-inflammatory	1402	2
Stachytarpheta cayennensis (Rich.) Vahl. [Verbenaceae]	Gervão	Leaf Infusion	Inflammation, healing	1085	2
Stryphnodendron coriaceum Beth [Fabaceae]	Barbatimão	Bark decoction	Vaginal infection, toothache, healing, inflammation	1033	3
Symphytum officinale L. [Boraginaceae]	Confrei	Leaf Infusion	Healing, cancer, stomach pain	1096	2
Syzygium aromaticum (L.) Merrill & Perr [Myrtaceae]	Cravo	Fruit Decoction	Menstrual colic, pain, anti-inflammatory, sedative.	1428	3
Tithonia diversifolia Hemsl. Gray [Asteraceae]	Mão de Deus	Leaf Infusion	Stomach pain, diabetes, headache, stomach acidity	1419	3
Trattinnickia burserifolia Mart. [Burseraceae]	Amescla	Latex Decoction	Headache, healing	1416	2
Turnera ulmifolia L. [Turneraceae]	Chanana	Leaf Infusion	Gastritis, back pain, inflammation	1089	4
Uncaria tomentosa (Willd.) DC. [Rubiaceae]	Unha de gato	Root Decoction	Gastritis, uterine infection, sinusitis, headache	1404	1
Urtica dioica L. [Urticaceae]	Urtiga	Root Decoction	Inflammation, kidney problems	1421	2
Vernonia brasiliana Less [Asteraceae]	Assa Peixe	Leaf Infusion	Flu, pneumonia, expectorant, asthma, conjunctivitis	1263	3
Vitex orinocensis H.B.K [Verbenaceae]	Tarumã	Bark Decoction	Inflammation	605	1

Table 2. Medicinal plants more cited in the state of Maranhão, Northeastern Brazil (AF: Absolute frequency; RF: Relative frequency)

Family	AF	RF (%)	Family	AF	RF (%)
Anacardiaceae	3	5.00	Liliaceae	1	1.67
Annonaceae	1	1.67	Lauraceae	1	1.67
Apiaceae	1	1.67	Malvaceae	2	3.33
Apocynaceae	1	1.67	Musaceae	1	1.67
Arecaceae	3	5.00	Myrtaceae	2	3.33
Asteraceae	5	8.33	Phytolaccaceae	1	1.67
Bignoniaceae	1	1.67	Rubiaceae	2	3.33
Boraginaceae	1	1.67	Rutaceae	1	1.67
Burseraceae	1	1.67	Scrophulariaceae	1	1.67
Caprifoliaceae	1	1.67	Solonaceae	2	3.33
Caryocaraceae	1	1.67	Turneraceae	1	1.67
Chenopodiaceae	1	1.67	Urticaceae	1	1.67
Crassulaceae	1	1.67	Verbenaceae	3	5.00
Euphorbiaceae	4	6.67	Vitaceae	1	1.67
Fabaceae	7	11.66	Zingiberaceae	2	3.33
Lamiaceae	6	10.0			
Total				60	100

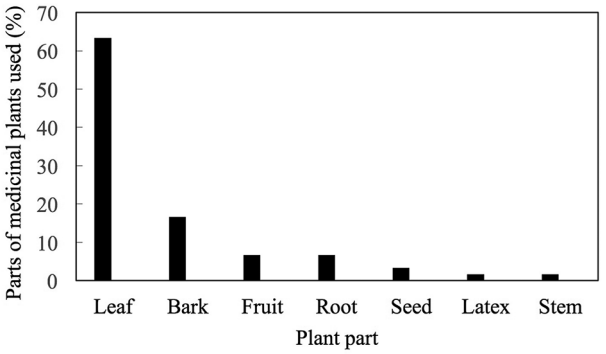

Figure 2. The relative frequency of use of parts of the plant in remedy preparations in the state of Maranhão, Northeastern Brazil.

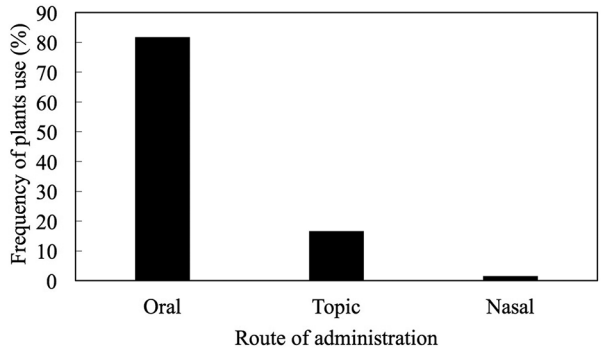

Figure 3. The relative frequency of administration route, with reference to the medicinal plants studied, in the state of Maranhão, Northeastern Brazil.

DISCUSSION

The current survey revealed the utilization of 60 species of medicinal plants for treatment of 43 health problems, as follows: 21 to treat inflammation, eight for healing, eight for flu, seven for stomach pain, six for menstruation and six for headache. It can be observed that the same plants are used to treat several pathologies. Other problems are less treated with medicinal plants.

The ethnobotanical study performed by Linhares *et al*. 2014, with medicinal plants commercialized in fairs and markets of São Luis, revealed that most common form of administration was infusion (herbal tea), 58%, followed by bath (12%). Plant parts used mainly leaves (63.3%), followed by bark and fruits. Leaves are more easily collected and are found throughout the year, corroborating the observations of Castellucci *et al*. (2000) and Oliveira *et al*. (2010). These observations are in accordance with this study, in Imperatriz.

The predominance in the use of plant leaves and bark is often associated with climate and environmental conditions of a region. In the Caatinga biome, for example, present in Northeastern Brazil (equator zone), the temperature is high and varies from 26°C - 36°C, there are prolonged periods of drought, with occurrence of deciduous vegetation which loses its leaves during dry season and then the use of bark is very common. In places where there is still the presence of Atlantic forest or Cerrado, with evergreen vegetation type, with a hot and humid climate, the use of the leaves of medicinal plants for treating various diseases tends to be more frequent (Linhares *et al*. 2014). This could be seen in the present study, where predominates a tropical and sub-humid climate, and with the presence of the Amazon rainforest.

With regard to the route of administration and dosage the most common forms of plant use is leaf infusion, and dosage varies between one and three cups per day. Oliveira *et al*. (2010) and Souza *et al*. (2013) obtained similar results.

Monteles and Pinheiro (2007) studied medicinal species used at a Quilombo in the Maranhão state. They found 121 species, distributed in 56 botanical families. Lamiaceae was the most representative family, followed by Rutaceae, Asteraceae, Leguminosae and Euphorbiaceae. Leaves, bark and latex were the most commonly used plant parts in local medicine preparation, and these results corroborate our study.

The study of Almeida *et al*. 2012, in the state of Maranhão, found that 339 patients with HIV / AIDS used medicinal plants. The most common were: *Turnera ulmifolia,* and *Plectranthus barbatus* which are mainly used for gastric disorders, to treat hypertension, for cardiovascular problems, as bronchodilator, as antitumor, for platelet aggregation inhibition, as anti-inflammatory and antinociceptive agents

(Costa 2006). In the present study, the most used species were: *C. ambrosioides, M. urundeuva, L alba* and *P. barbatus.*

Although *C. ambrosioides* (mastruz) is largely used around the world as a vermifuge, in Brazil, this species is also used control arthropods and household pests; treatment of cutaneous lesions caused by *Leishimania (Vianna) braziliensis* (França *et al.* 1996); relief of stomachache and flu (Moreira *et al*., 2002) and for treating bruises and fractures (Sérvio *et al.* 2011). Different uses are probably due to different constituents of the used parts; seed extract and its essential oils combat worms (Kliks 1985), and the leaves are used in inflammation and the treatment of injured body parts.

The toxicity of *C. ambrosioides* is due to the main constituent ascaridol present in the essential oil, especially if used in large quantities, with toxic effects to the kidney, liver, intestine (Pereira *et al*. 2010), producing slight hepatotoxic lesions (Silva *et al.* 2014), changes in the nervous system such as headache, facial flushing, blurred vision and paresthesia, and also gastroenteritis with diffuse hyperemia and genotoxic effects (Gadano *et al*. 2006). Then attention is necessary for the doses of leaf and inflorescence extracts. In our study a peculiarity was observed, *C. ambrosioides* was the species most used by the population, perhaps due to its popularity, its apparent effectiveness, low cost and easy availability (MacDonald *et al.* 2004).

Myracrodruon urundeuva (aroeira do sertão) is distributed in several states of Brazil, being mainly found in Northeastern region, including Maranhão. It is used as an anti-inflammatory in the treatment of wounds, gastritis, gastric ulcers, cervicitis, vaginitis, and hemorrhoid infections (Lorenzi and Matos 2008, Mello *et al.* 2013). It is also indicated for treating headaches, toothaches and as an antiseptic and in general inflammation (Cartaxo *et al*. 2010). It is indicated as antimicrobial (Botelho *et al*. 2007), antiulcerogenic (Desmarchelier *et al.*1999) and as gastric mucosa protector (Carlini *et al*. 2010), having antibacterial, antifungal and bacteriostatic activity (Alves *et al.* 2009, Menezes *et al*. 2010; Machado and Oliveira 2014). *Myracrodruon urundeuva* stands out among medicinal plants with the most nominations in combating health problems in several ethnobotanical surveys of the Caatinga area (Cordeiro and Félix 2014). It is used for the treatment of cancer, inflammation, sore throat, kidney disease, spinal problems, prostate, liver inflammation, diarrhea, gastritis, diphtheria and cough (Silva and Freire 2010; Roque *et al*. 2010; Marinho *et al.* 2011). This species was also one of the more commercialized in fairs and markets in Sao Luis, Maranhão (Linhares *et al.* 2014) confirming the high utilization by the local population of this medicinal plant, as an anti-inflammatory, as well as in Imperatriz. There are many pharmacological studies, which corroborate popular use and analgesic and antiinflammatory activities. It was demonstrated that *M. urundeuva* has a fraction containing three dimeric chalcones (chalcone enriched fraction – CEF), named urundeuvines isolated from the stem-bark ethyl acetate extract (Viana *et al.* 2003).

Lippia alba (erva sidreira) is an aromatic shrub that belongs to the Verbenaceae family. It is native to South America, and widely distributed. It is known and used in Brazil for different purposes, mainly due to the anxiolytic activity of the tea obtained from its leaves (Santos *et al*. 2004). The leaf infusion shows antispasmodic action having digestive effect (Blanco *et al*. 2013), and also present molluscicide action. The species is mainly used for digestive and respiratory ailments, being a sedative and antihypertensive remedy, having anti-infectious and analgesic properties (Hennebelle *et al*. 2008). *Lippia alba* and *P. barbatus* species were also the most cited in the work of Madaleno (2011) about main plants used by the population of São Luís.

Plectranthus barbatus (Brazilian-boldo) is widely grown in Brazil and used as a medicinal plant. Despite its main use by the local population for gastric disturbances, a great number of pharmacological actions have been tested and proved for this species: such actions involve compounds present in their leaves, stems, and roots. Among their pharmacological actions, the following can be highlighted: hypotensive, cardiovascular protector, bronchodilator, adenylate cyclise stimulator, platelet aggregation inhibitor (antimetastasis), antitumor, anti-nociceptive and anti-inflammatory (Costa 2006). The study of Madaleno (2011), held in São Luís, showed a high utilization of this species by the population. The compounds barbatusin and 3-beta-hydroxy-3-deoxibarbatusin present in *P. barbatus* leaves, demonstrated a gastroprotection action against gastric damage induced by ethanol (Rodrigues *et al.* 2010). These results indicate that these compounds contribute for the main activity reported for *Plectranthus* species, to treat gastric disturbances.

CONCLUSIONS

It was observed that the most common use of medicinal plants is in the treatment of inflammation, wound healing, flu and pain. The plants most used were *Chenopodium ambrosioides, Myracrodruon urundeuva*, *Lippia alba* and *Plectranthus barbatus*. The information obtained contributed to point out medicinal plants from State of Maranhão for future phytochemical and pharmacological studies, aiming the development of new drugs that can be safer and effective for the treatment of diseases. The popular knowledge confirmed by scientific studies can contribute to the rational use of medicinal plants and the importance of preserving them.

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