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The use of herbal medicine in a rural community in Vitoria da Conquista, Bahia, Brazil: an indication for pharmacological studies

Abstract

The present study evaluated ethno medicinal knowledge of people in the rural community of São Sebastião, Vitória da Conquista, Bahia, Brazil. Using semi-structured interviews, 84 randomly chosen individuals informed about the use of traditional medicinal plants in their community, thereby identifying their therapeutic potential, which were categorized according to the ICD-10 (International Statistical Classification of Diseases and Related Health Problems). The collected data were analyzed with using the Informant consensus factor (ICF), the Relative importance (RI) and the scores were calculated by using Fidelity level (FL). Forty-six species traditionally used in treatment of ailments were categorized as diseases: digestive system, respiratory problems, general symptoms/signs, nervous system and circulatory system. *Lippia alba, Cymbopogon citratus* and *Foeniculum vulgare* had a RI >1, indicating important value to the community. Highest values of FL were: *Spondias purpurea*, *Bauhinia forficata*, *Punica granatum*, *Matricaria chamomilla*, *Stryphnodendron adstringens*, *Foeniculum vulgare*, *Mentha piperita*, *Amburana cearensis* and *Dysphania ambrosioides*. *S. purpurea*, to treat hypertension, and *Amburana cearensis* (indigestion) deserve in depth pharmacological and toxicological studies so that they might be included in the National Program of Medicinal Plants and Phytotherapics of the Brazilian Sistema Único de Saúde and safely prescribed by regional health teams, lowering costs for local health system.

Keywords: ethnobotanical study, northeast brazil, traditional medicine, medicinal plants, spondias purpurea

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Abbreviations: ICF, informant consensus factor; RI, relative importance; FL, fidelity level; UESB, universidade estadual do sudoeste da bahia, HUESBVC, herbarium at uesb, vitoria da conquista

Introduction

Brazil is a continental country with six different biomes, Amazon, Atlantic Forest, Cerrado, Caatinga, Pantanal and Pampa,[1] of which 3 are represented in the State of Bahia (Atlantic Forest, Caatinga, Cerrado).[2,3] Traditional knowledge of medicinal plants used by indigenous populations of rural areas of Bahia has not received enough attention so far, although in northeastern Brazil there are ethnobotanical studies recently published.[4–8] Vitoria da Conquista, Bahia was formerly (18th Century) inhabited by the Indian tribes Mongoiós (subgroup Camacãs), Ymborés (or Aimorés) and to a lesser extent by the Pataxós. Their villages were scattered over a wide range, known as the Sertão da Ressaca. Today, the original vegetation cover in Vitória da Conquista does not exceed 10%, consisting of Caatinga and Atlantic Forest biomes.[9] This vegetation type is of fundamental importance for maintaining the quality of regional watersheds, such as Rio Mole, Rio Pardo and Rio Caculé (rivers) that benefit a large population of southwestern Bahia.[10] The rural communities, mainly extinguished Brazilian natives (indigenous communities) own diverse knowledge about plants and caring for the environment. Thus, the need of research on communities and how they deal with plants so that their descendants acquire their traditional knowledge.[11]

Use of medicinal plants has grown considerably in the second half of the 20th century, from many parts of the world. In the developing countries 65-80% of the population depends exclusively on the medicinal plants for the basic healthcare,[12] including Northeastern Brazil.[5] Brazil was considered the seventh largest market, and from 2006 to 2010 grew by 14% and it is also estimated that by 2015 Brazil will be the sixth largest market in this sector.[13] Important policies were implemented in the last decade to encourage research and development related to the use of medicinal plants and herbal remedies which may be provided with quality, safety and efficacy to the population, prioritizing the country's biodiversity.[14] Considering the actual worldwide popular use of medicinal plants, the *Sistema Único de Saúde* (SUS, Brazilian Health System), via the Brazilian Ministry of Health, has introduced the National Policy on Integrative and Complementary Practices and the National Policy on Medicinal Plants in 2006[13,15] which lists some indications for the use of medicinal plants, such as *Aloe vera* L. (against psoriasis and burns), *Salix alba* L. (against backache) and *Rhamnus purshiana* DC. (to treat constipation). The increased prescription of medicinal plants via physicians of SUS has not only raised their consume in health care but has also helped to educate about possible dangers of their indiscriminate use. As prescription of local herbal medicines by qualified professionals and accurate information have increased and this will help to prevent medical application of unsafe and ineffective plants.[16,17]

Different tools to quantify ethno botanical data are applied in complementing studies of plant usage in folk medicine. Thus, collection of quantitative data could support the conservation of certain plant species and knowledge of their popular medical use, mainly by informing about species with several therapeutic indications.[18,19] Some of these tools have been successful in identifying the pharmacological potential of medicinal plants, thus enabling their effective application in herbal medicine.[20–22] The present study evaluated the ethno medicinal knowledge of the people in the community of São Sebastião, Vitória da Conquista, Bahia, using ethno botanical tools in order to

provide baseline information for future ethno pharmacological and phytochemical studies.

Materials and methods

Study area

The study area is located in the state of Bahia and the survey was conducted in the village of São Sebastião, which belongs to the city of Vitória da Conquista (14° 47' S and 40° 39' W). São Sebastião is a small rural community of 2,730 inhabitants (1,325 men and 1,405 women, average monthly income of U$ 280), to whom the use of medicinal plants may not only be a tradition but also an economic necessity; indeed, this area still hosts many Brazilian native plants, which are worth thorough study and protection, as elsewhere in Brazil.[23,24] Figure 1 shows the detailed location map of the study area.

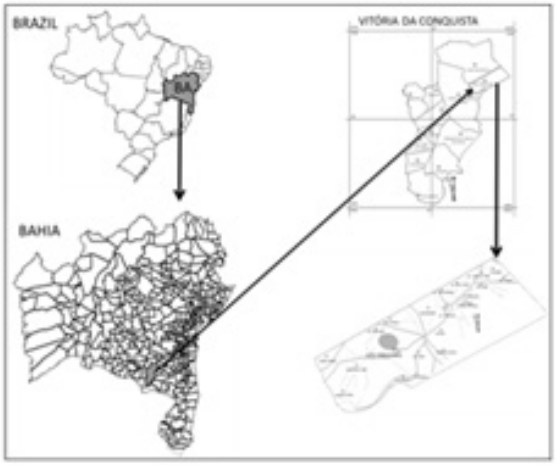

Figure 1 Location of the study area, village of São Sebastião, Vitória da Conquista, Bahia, Brazil.

Ethnobotanical survey

Data were collected during 2012 to 2014. Participants signed the Term of Free and Clarified Assent (demanded by the National Health Council through the Ethics and Research Committee, Resolution 196/96 of the CNS/MS). The study was approved by the Committee of Ethics in Research with Human Beings (CEP) of the State University of Southwestern Bahia (Universidade Estadual do Sudoeste da Bahia-UESB) (N° 0134.0.454.000.11). Data of the semi-structured questionnaires informed on the respondents profile and knowledge about plants used in medicinal therapy, how the knowledge was acquired, plants frequently used by that community and their common therapeutic indications. The cited regional plant species were collected, identified and integrated into the collection of the herbarium at UESB, Vitoria da Conquista (HUESBVC).

Data analysis

The citations for therapeutic purposes were classified according to ICD-10 (International Statistical Classification of Diseases and Related Health Problems) established by World Health Organization.[25] The Informant Consensus Factor (ICF) was calculated for each ailment category to identify the agreements of the informants on the reported cures for the group of diseases.[26] The Relative Importance Value (RI), a measure of the diversity of medicinal applications, was calculated for each medicinal plant cited by informants.[27] The highest possible RI value (2.0) indicates the species with the highest diversity of medicinal use. Scores were calculated Fidelity Level (FL).[28]

Results and discussion

Socio-demographic information

Eighty-four (84) community residents were interviewed (83.3% women aged between 18 and 80years, half declaring themselves "housewives") representing 84 families of whom 96% used medicinal plants to treat different diseases. In regard to the level of schooling, 10.8% were illiterate, 63.1% of respondents did not complete elementary school, 11.8% did not complete secondary school and 14.3% completed secondary school.

Acquisition, parts used and mode of preparation of medicinal plants

Table 1 reports 46 medicinal plants belonging to 30 families. This survey showed that some 80% of the species with medicinal properties were cultivated in orchards or gardens in backyards of the houses; 15% are considered wild and extracted from the surrounding environments and 5% of the plants were bought at popular markets or drugstores, demonstrating the importance of cultivation as the main source of medicinal plants. Several authors in similar ethnopharmacological studies have also reported that the majority of respondents acquired plants grown in their own backyard cultivars.[20,24] The leaves (78.2%) were the most frequently used plant part for the treatment of diseases, followed by root (8.2%) and seed (6.4%) (Figure 2), which corroborated similar results found in other ethnobotanical studies.[29,30] In many parts of Brazil the use of teas is a common practice. The main preparation methods of the plants cited were by decoction (69.3%), boiling plant material in water, and infusion (21.2%), which is worrying since infusion is used to prepare all tender parts of medicinal plants such as leaves, buttons and flowers, rich in volatile components, delicate aromas and active principles, degraded by the action of water and heat.[31]

Ailments treated by medicinal plants

Respondents were asked to associate a medicinal plant with possible health care indications, according to WHO.[24,32] The highest number of citations (106) was for digestive system, while the highest ICF value was obtained for nervous problems (0.85) and digestive system (0.84). Values for nine common diseases categories are given in Table 2. Most cited were those categories related to the digestive system (32.8%), followed by respiratory diseases (17%), general symptoms/signs of inflammation (14.5%), nervous system (13.3%) and circulatory system diseases (12.6%). Similar results were already found in other studies[20,24,33,34] indicating that the residents of São Sebastião use medicinal plants as the first line of treatment for most common diseases.

Use and efficacy of the medicinal plants

Species with high value of RI (>1) are used to treat a variety of diseases and are therefore considered important to a community.[27] *Lippia alba* with RI = 2 was the most versatile species in relation to its use and was indicated for cures of up to 6 body systems, followed by *Cymbopogon citratus* and *Foeniculum vulgare* (Table 3). All plants with RI >1 through this methodology assume that a plant is important when it is most versatile; they are measures of folk knowledge and interpretations of their use must be carefully made.[4] The data indicated that some plants have more diversified medicinal uses or applications than others.[35] Among all plants, *Lippia alba* with RI=2 was the most versatile species in relation to its use and has often been reported in ethnobotanical studies[36] and pharmacological use, for example, vasorelaxant effect,[37] action as a tranquilizer[38] and effective

at preventing gastric ulceration.[39] However, when the objective is the search for new plant-derived drugs, the concordance of the answers as to the medicinal use of a particular plant is extremely important. Plants indicated for many different applications would have less credibility compared to those with a higher fidelity of use.[33] Plants with relatively high level of concordance, i.e., with multiple informants agreeing on their therapeutic value, suggest a real efficacy in disease treatment.[28]

Table 1 List of traditional medicinal plants investigated in this study with their related information

Voucher	Scientific name	Family	Popular name brazil	Part plant indicated	preparation
6453	*Dysphania ambrosioides (L) Mosyakin & Clemants*	Amaranthaceae	Mastruz	Root, leaves	Juice, infusion, decoction, maceration (cutaneous)
8010	*Allium sativum L*	Amaryllidaceae	Alho	Bulb	Decoction, juice, infusion
6452	*Spondias purpurea L*	Anacardiaceae	Seriguela	Leaves	Decoction
6377	*Foeniculum vulgare Mill.*	Apiaceae	Erva doce	Leaves, seed	Infusion, decoction
8008	*Lepidium virginicum L.*	Brassicaceae	Agrião	Leaves	Syrup
8007	*Ananas comosus (L.) Merr.*	Bromeliaceae	Abacaxi	Fruit	Decoction
8018	*Matricaria chamomilla L.*	Compositae	Camomila	Flower	Infusion
7994	*Bidens pilosa L.*	Compositae	Carrapicho de agulha	Root	Infusion, decoction
8012	*Solidago microglossa DC.?*	Compositae	Arnica	Leaves	Infusion
7999	*Baccharis trimera (Less.) DC.*	Compositae	Carqueja	Leaves	Decoction
8019	*Costus sp.*	Costaceae	Cana dágua	Leaves	Decoction
8040	*Cucumis sativus L.*	Cucurbitaceae	Pepino	Fruit	Juice
7989	*Sechium edule (Jacq.) Sw.*	Cucurbitaceae	Chuchu	Leaves	Decoction
8030	*Eleocharis sp.*	Cyperaceae	Junça	Root	Decoction
8037	*Aleurites moluccanus (L.) Willd*	Euphorbiaceae	Nogueira	Seed	Maceration
8045	-	Lamiaceae	Tioioiô	Leaves	Decoction
6459	*Plectranthus barbatus Andrews*	Lamiaceae	Boldo	Leaves	Infusion, decoction, juice
8002	*Mentha spicata L.*	Lamiaceae	Hortelãzinho	Leaves	Syrup, infusion, decoction
8028	*Plectranthus amboinicus (Lour.) Spreng.*	Lamiaceae	Hortelã grosso	Stem, leaves, root	Syrup, decoction
8005	*Ocimum basilicum L.*	Lamiaceae	Alfavaca	Leaves	Syrup, infusion
8009	*Rosmarinus officinalis L.*	Lamiaceae	Alecrim	Leaves	Decoction, syrup
8041	*Mentha sp.*	Lamiaceae	Poejo	Leaves	Infusion
8006	*Persea americana Mill.*	Lauraceae	Abacate	Leaves	Juice
8043	*Senna sp.*	Leguminosae	Sene	Leaves	Infusion
8014	*Stryphnodendron adstringens (Mart.) Coville*	Leguminosae	Barbatimão	Root, leaves, bark	Infusion, decoction
8046	*Amburana cearensis (Allemao) A.C.Sm*	Leguminosae	Umburana macho, Umburana, amburana, amburana-de- cheiro, imburana, cerejeira-rajada.	Seed, bark	Infusion, decoction
8038	*Bauhinia forficata Link*	Leguminosae	Pata de vaca	Leaves	Infusion, decoction
6460	*Punica granatum L.*	Lythraceae	Romã	Leaves	Infusion, decoction
6461	*Malpighia emarginata DC.*	Malpighiaceae	Acerola	Leaves	Juice
8022	*Dorstenia sp.*	Moraceae	Contra- erva	Root	Decoction
8036	*Myristica fragrans Houtt*	Myristicaceae	Nós moscada	Seed, fruit	Juice, decoction
7996	*Eugenia uniflora L.*	Myrtaceae	Pitanga	Leaves	Decoction
8024	*Eucalyptus sp.*	Myrtaceae	Eucalipto	Leaves	Infusion, decoction
8021	*Averrhoa carambola L.*	Oxalidaceae	Carambola	Leaves	Infusion
8033	*Passiflora edulis Sims*	Passifloraceae	Maracujá	Leaves	Infusion, decoction
8042	*Phyllanthus heteradenius Müll.Arg.*	Phyllanthaceae	Quebra-pedra	Root, stem, leaves	Decoction
8044	*Plantago major L.*	Plantaginaceae	Transagem	Leaves, root	Infusion, decoction
6384	*Cymbopogon citratus (DC.) Stapf.*	Poaceae	Capim santo	Leaves, root	Infusion, decoction, inhalation, juice
8029	*Genipa americana L.*	Rubiaceae	Genipapo	Fruit	Juice
8032	*Citrus limon (L.) Osbeck*	Rutaceae	Limão	Leaves, fruit	Decoction, juice
8031	*Citrus sinensis (L.) Osbeck*	Rutaceae	Laranja	Leaves	Decoction
8013	*Ruta graveolens L*	Rutaceae	Arruda	Leaves	Maceration
8017	*Solanum melongena L*	Solanaceae	Beringela	Fruit	Juice
7995	*Lippia alba (Mill.) N.E. Brown*	Verbenaceae	Erva-cidreira	Leaves, seed, root	Infusion, decoction
8016	*Aloe vera L.Burm.f.*	Xanthorrhoeaceae	Babosa	Leaves	Scraping, topic contact
8026	*Zingiber officinale Roscoe*	Zingiberaceae	Gengibre	Root	Decoction

Table 2 Informant consensus factor (ICF) by category of diseases. (ICF is the number of use citations in each category minus the number of species used, divided by the number of use citations in each category minus one).

Category	Species	Citations	ICF
Nervous system	7	43	0.85
Digestive system	17	106	0.84
Respiratory diseases	17	55	0.70
Circulatory system diseases	13	41	0.70
General symptoms/signs[a]	17	47	0.65
Endocrine disorders	4	8	0.57
Genitourinary diseases	10	14	0.30
Skin ailments	3	5	0.5
Neoplasias	1	1	0
Infectious diseases	1	1	0
Diseases of the musculoskeletal system	1	1	0
Diseases of the ear	1	1	0

[a]symptoms and signs such as stomachache, inflammation, infection, fever, headache, malaise

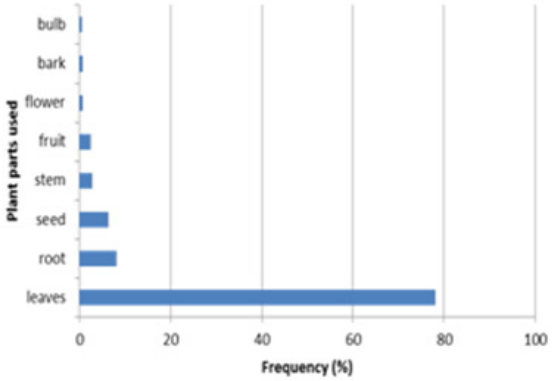

Figure 2 Plant parts used for treating diseases/disorders.

In order to find therapeutically potent plants for chemical screening, the Fidelity Level (FL) values of 16 medicinal plants (Table 4) were cited by three or more informants. Two plants were obtained: *Spondias purpurea* and *Bauhinia forficata,* with the highest (100%) FL values for hypertension and diabetes respectively. The species that gave the highest fidelity level values are considered more promising candidate plants for further pharmacological investigations and deserve priority attention.[35] Most plants mentioned in the study, for example, *Bauhinia forficata, Punica granatum, Matricaria chamomilla* and *Stryphnodendron adstringens* showed high FL, as expected, since literature has plenty of ethnopharmacological studies related to them. However, the plants which mentioned high FL, *Spondias purpurea* and *Amburana cearensis*, are suggested for further study. *Spondias purpurea* was cited for only one treatment (hypertension, 100%), it is exotic (not originally native from Brazil), though it is widely used in northeastern Brazil. *Amburana cearensis* (indigestion, 55.5%) is native from Brazil and has few published information for a therapeutic target, furthermore it has been reported in other studies ethnobotanical.[12,32] Therefore, these species are promising candidates for pharmacological studies.

Comparison of outstanding medicinal plants with the literature and other studies

Comparison of the pharmacological literature published in different countries with the present ethnobotanical data showed that many of the plants have earlier been reported to have activities against specific diseases. Examples include *Bauhinia forficata*, used to treat diabetes, and *Allium sativum,* used to treat hypertension problems. Such observations hinted at the fidelity of the reports by the residents of São Sebastião, confirming that this knowledge has been preserved as in other communities. Whereas other medicinal plants are used differently, when compared to other traditional practices, for example *Amburana cearensis* was used against indigestion, but it was mentioned in other studies for antibacterial activity, to treat rheumatism, cold, sinusitis[40] and as anti-inflammatory[41] (Table 5). There is also a species used in this study, *Spondias purpurea*, but not mentioned in the literature for its medicine purpose.

Comparing this study to other ethnobotanical studies on traditional medicinal plants in Northeastern Brazil, although with areas of study in different proportions and methods of research, it was possible to observe that considerable similarity exists with respect to categories of cited diseases (problems of the respiratory system, digestive system, circulatory system).[4,5] According to this study, *Amburana cearensis* and *Bauhinia* sp are the most common medicinal plants in Northeastern Brazil cited in ethnobotanical surveys.[5,6,12,23,18]

Table 3 Relative importance (RI) values for medicinal plants used against specific ailments.

Species	Relative importance	Origin*	categories
Lippiaalba	2.0	Native	Diseases of the nervous system, genitourinary system, circulatory system, diseases, respiratory system, symptoms and signs involving the digestive system and the abdomen, general signs and symptoms
Cymbopogon citratus	1.87	Exotic	Diseases related to the respiratory system, circulatory and nervous, symptoms and signs involving the digestive system and the abdomen, diseases of the genitourinary system, general signs and symptoms
Foeniculum vulgare	1.43	Exotic	Diseases, symptoms and signs involving the digestive system and abdomen, diseases of the nervous system, diseases of the circulatory system, categories general signs and symptoms, , diseases of the genitourinary system
Aloevera	0.59	Exotic	Neoplasias, diseases of the skin, symptoms and signs involving the digestive system and the abdomen, categories general signs and symptoms
Mentha spicata	0.83	Exotic	Diseases digestive system and abdomen, diseases respiratory system, diseases of the genitourinary system
Dysphania ambrosioides	0.80	Native	Diseases, symptoms and signs involving the digestive system and abdomen, Diseases related to the respiratory system, general symptoms and signs, diseases of the skin
Myristica fragrans	0.59	Native	Symptoms and signs involving the digestive system and the abdomen, general signs and symptoms, diseases of the circulatory system
Punica granatum	0.57	Exotic	Categories respiratory, digestive and genitourinary systems
Passiflora edulis	0.54	Native	Categories nervous system, circulatory, endocrine, nutritional and metabolic diseases

Table Continued...

Species	Relative importance	Origin*	categories
Amburana cearensis	0.51	Native	Diseases digestive system and abdomen, general signs and symptoms
Plectranthus barbatus	0.45	Exotic	Diseases digestive system and abdomen, general signs and symptoms
Plectranthus amboinicus	0.43	Exotic	Diseases respiratory system, infectious diseases
Alliumsativum	0.39	Exotic	Respiratory diseases, diseases of the circulatory system
Stryphnodendron adstringens	0.37	Native	Categories general signs and symptoms, genitourinary, and skin diseases
Citrus limon	0.37	Exotic	Respiratory diseases, diseases of the circulatory system
Bauhinia forficata	0.24	Native	Diseases of the circulatory system, endocrine, nutritional and metabolic diseases
Matricaria chamomilla	0.19	Exotic	Diseases of the nervous system
Ocimum basilicum	0.19	Exotic	Respiratory diseases, diseases of the circulatory system
Spondias purpurea	0.18	Exotic	Diseases of the circulatory system

(RI=NP+NCS) where NP is obtained by dividing the number of properties (reported specific ailments) attributed to a species divided by the total number of properties attributed to the most versatile species (species with the highest number of properties). NBS is the number of body systems (ailment categories) treated by a given species divided by the total number of body systems treated by the most versatile species). Medicinal plant species used by community residents of Vitória da Conquista, recorded three or more times.

*All plants not originally native from Brazil were considered exotic

Table 4 Fidelity level (FL) values of medicinal plants cited by three or more informants. FL= (Ip/Iu x100), where Ip is the number of informants who independently indicated the use of a species for the same major ailment and Iu the total number of informants who mentioned the plant for any major ailment

Scientific names	Category	Ip	Iu	FL (%)
Spondias purpurea	Hypertension	6	6	100
Bauhinia forficate	Diabetes	5	5	100
Punica granatum	Sore throat	3	4	75
Matricaria chamomilla	Tranquilizer	2	3	66,6
Stryphnodendron adstringens	Inflammation	2	3	66,6
Foeniculum vulgare	Flatulence	20	34	58,8
Mentha spicata	Influenza	10	17	58,8
Amburana cearensis	Indigestion	5	9	55,5
Dysphania ambrosioides	Inflammation	5	9	55,5
Myristica fragrans	Headache	2	4	50
Allium sativum	Hypertension	2	4	50
Aloe vera	Skin diseases	2	4	50
Plectranthus amboinicus	Influenza	3	6	50
Plectranthus barbatus	Indigestion	3	7	42,8
Lippia alba	Flatulence	19	57	33,3
Cymbopogon citratus	Hypertension	17	54	31,4

Table 5 Comparison of the uses of medicinal plants recorded with information gathered from the literature

Scientific Name	Ailments recorded in the present Study	Main use in the Present Study	Some medicines uses reported in the literature
Alliumsativum	Influenza and hypertension	Hypertension	Antifungal, antibacterial, antitumor, anti-inflammatory, antithrombotic,[42] anti-hypertensive,[43] attenuated left ventricular diastolic dysfunction and fibrosis without significantly decreasing systolic blood pressure in hypertensive rats[44]
Aloevera	Hair loss, stomachache, skin inflammation, cancer, ulcer	Skin diseases	Lowering LDL, increasing HDL, decreasing blood glucose level, treating genital herpes and psoriasis,[45] positive effect on body mass, caecum and tibial bones in the short term[46] anti-inflammatory activity.[47]
Amburana cearensis	Headache, stomach problems, ulcer, intestinal Infection	Indigestion	Used to treat rheumatism, cold, and sinusitis .[40], anti-inflammatory,[41] antibacterial activity[48,49]
Bauhinia forficata	Diabetes	Diabetes	Antidiabetic activity,[50] hypoglycemic activity,[51] antioxidant activity, beneficial in the prevention of diabetes complications associated with oxidative stress[52]
Cymbopogoncitratus	Hypertension, tranquilizer, cramps, stomach problems, influenza, headaches	Hypertension	Cardio protective potential is mainly because of its antioxidant activity,[53] antispasmodic, hypotensive, anticonvulsant, analgesic, antiemetic, antitussive, antirheumatic, antiseptic and treatment for nervous and gastrointestinal disorders and fevers,[54] antioxidant activity, antidiabetic activity,[55] anti-hypertensive .[56]
Dysphania ambrosioides	Inflammation, toothache, scarring, ulceration, infection	Inflammation	Antitumor effect,[57] anti-inflammatory activity .[58], antifungal activity,[59] amoebicidal activity [60]

Table Continued...

Scientific Name	Ailments recorded in the present Study	Main use in the Present Study	Some medicines uses reported in the literature
Foeniculumvulgare	Intestinal problems, hypertension, urinary infection	Flatulence	Colic in breastfed infant,[61] antimicrobial properties[62] was confirmed in review the used in many parts of the world for the treatment of a number of diseases, for example, abdominal pains, antiemetic, colic in children, constipation, depurative, diarrhea, flatulence and irritable colon[63]
Lippiaalba	Stomach and intestinal problems, influenza, tranquilizer, insomnia, hypertension, fever	Tranquilizer	Sedative, anxiolytic activities,[64] antibacterial, antifungal,[65] vasorelaxant effect was evaluated *in vitro* in rat superior mesenteric artery rings[37]
Matricaria chamomilla	Tranquilizer and insomnia	Tranquilizer	Decreased stress in bovines, associated with inhibition of cortisol production and calming and anxiolytic effects[66] sleep aid, sedation[67] induce recovery from a polycystic ovary syndrome induced state in rats, but also increase dominant follicles, better endometrial tissue arrangements can be regarded as another therapeutic effect[68] protective effects on paraquat-induced damage via oxidative stress in rat lung.[69]
Mentha spicata	Stomach and intestinal problems, influenza, coughs, inflammations	Influenza	Effective inhibitor of LPS-induced inflammation7[0] antioxidant effects[71] effective for antiemetic treatment[72]
Myristica fragrans	Hypertension, headache, stomach problems	Headache	Extracts of nutmeg showed a good antidiarrheal effect, with a significant sedative property.[73]
Plectranthus amboinicus	Influenza, cough, worms	Influenza	The aqueous extract has the analgesic and anti-inflammatory abilities ,[74,75] for diabetes, which may be due to the presence of flavonoids[76] exhibited antioxidant, diuretic, anti-inflammatory, cytotoxic and antimicrobial activities,[77] effectiveness against methicillin-resistant *Staphylococcus aureus* skin abscesses,[78] treatment of rheumatoid arthritis[79]
Plectranthus barbatus	Stomach problems (indigestion, nausea, vomiting, stomach pain, hangover)	Indigestion	The plant is also used to treat gastritis and intestinal spasms,[80] stomach pain, nausea, vomiting and is used as purgatives, carminatives and as anthelmintic[81] antioxidant activity[82]
Punicagranatum	Sore throat, stomach problems, uterine problems	Sore throat	Wound healing activity .[83],anti-inflammatory effects[84] might be used as an antibacterial agent in controlling oral infections[85]
Spondias purpurea	Hypertension	Hypertension	Antimicrobial activities,[86] antioxidant activity[87]
Stryphnodendron adstringens	Inflammation and healing	Inflammation	Anti-inflammatory activity[88] antibacterial activity [89,90] antifungal activity,[91] reducing bacterial .[92], tyrosinase inhibitory activity,[93] in the treatment of leucorrhea, gonorrhea, gastritis, diarrhea, bleeding, and wound healing[94]

Conclusion

Ethnobotanical studies in rural areas in Bahia, Brazil, are rare and, when available published in local reports, Brazilian journals or part of Governmental technical reports available mainly in Portuguese, these may contribute to perpetuate local knowledge far from the light of scientific knowledge. Additionally, more studies like this should be done in Bahia, by the cultural and biological diversity, and because it is the biggest state of Northeastern Brazil. The results presented here indicated that medicinal plants are commonly used by São Sebastião rural population, a total of 46 species were documented, the main indications for medicinal plant use were against digestive system, circulatory system and respiratory diseases and of general symptoms/signs of inflammation. This evidences that the knowledge on the use of medicinal plants in this region has been preserved, since 80% of the species with medicinal properties were cultivated in the houses.

In regard to future studies, it is suggested that plants with high FL deserve attention for pharmacological studies, phytochemical, toxicological and clinical trials so that they might be included in the National Program of Medicinal Plants and Phytotherapics of the Brazilian Sistema Único de Saúde and safely prescribed by regional health teams, because there are still few plants in listed in this program. Thus, this work aimed to contribute in the long-run to improved health care in the regions of study, preservation of local knowledge, as well as search for pharmacologically principles from plants.

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Conflicts of interest

Author declares there are no conflicts of interest.

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