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Medicinal flora of the Maranhão, Brazil: plants species and their therapeutic indications in popular use

The Brazil is considered a megadiverse country, with a diversified flora, present in their different biomes, with characteristics especially typical, with plants species with different popular use, major of medicinal utilization. Known the plants species used for the people is important, for very species same not were investigated of scientific form, verifying their potentialities medicinal and therapeutically. The research presented 70 species, distributed in 58 genera and 28 botanical families. The work present for all species with scientific name, family, Common name, part used, use form and Therapeutic indication. Plates with imagens of any plants species medicinal are presents.

Keywords: Brazilian biodiversity; Ethnobotanical; healing plants; Urban plants.

Flora medicinal do Maranhão, Brasil: espécies vegetais e suas indicações terapêuticas no uso popular

O Brasil é considerado um país megadiverso, com uma flora diversificada, presente nos seus diferentes biomas, com características especialmente típicas, com espécies vegetais com diferentes usos populares, principalmente de utilização medicinal. Conhecer as espécies vegetais medicinais usadas pela população é importante, pois muitas espécies ainda não foram investigadas cientificamente, verificando suas potencialidades medicinais e terapêuticas. A pesquisa apresentou 70 espécies, distribuídas em 58 gêneros e 28 famílias botânicas. O trabalho apresenta para todas as espécies com nome científico, família, nome popular, parte usada, forma de uso e indicações terapêuticas. Pranchas com imagens de algumas espécies vegetais medicinais são apresentadas.

Palavras-chave: Biodiversidade brasileira; Etnobotânica; Plantas que curam; Vegetação urbana.

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INTRODUCTION

Brazil is considered one of the most biodiverse countries on the planet, as it has about 20% of the total number of species in the world (MACIEL et al., 2002; ALBUQUERQUE et al., 2007a). Currently there are an estimated 383,671 species worldwide, where 124,993 species occur on the American continent and 33,161 species are present in the Brazilian territory (ULLOA et al., 2017; LUGHADHA et al., 2016). However, part of this species diversity has not been investigated in relation to their therapeutic potentials, although this is a process that has been evolving significantly (SIMÕES et al., 2003; OLIVEIRA et al., 2009; CARTAXO et al., 2010).

Several cultural groups resort to plants as therapeutic resources, and in recent years their use has intensified as an alternative or complementary to traditional medicine treatments (DORIGONI et al., 2001). The use of medicinal plants is a common practice among peoples around the world and has even received incentives from WHO itself. According to the World Health Organization (WHO), about 80% of the world's population has used some herb type, seeking relief from some unpleasant symptoms or illness, where at least 30% of this was due to medical indication (MACIEL et al., 2002).

Medicinal plants are those with therapeutic potential or that have defined effects on diseases or symptoms and, according to Di Stasi (1996), after careful studies, represent an inexhaustible source of commonly approved drugs used, as well as a rich source of new active ingredients, with potential biological activities.

These active ingredients are chemicals resulting from the secondary metabolism of plants that can act beneficially or act toxic to organisms. Therefore, in order for people to be able to safely and safely use these substances, they must be studied from a chemical, pharmacological and toxicological point of view, avoiding indiscriminate use and believing only in empirical knowledge (RITTER et al., 2002).

Many years ago, the accumulated knowledge about medicinal plants was already quite extensive and deep and the healing properties of the plants, their effect on the organism and their application were already known. But the active principles or the reason why the plant acted this way or that in the organism were not known (NARDELLI, 2005).

In this context, further studies with medicinal plants are needed to know and rescue the medicinal potential of vegetables, as well as to provide subsidies for future research and discoveries of new active ingredients. Thus, the research aimed to know the flora of a Cerrado fragment from the state of Maranhão/Brazil, pointing out the medicinal potential of the species found, through bibliographic references, about the used part, form of use and Therapeutic indication of the inventoried species.

MATERIALS AND METHODS

Study area

The plant species were collected in the Cerrado fragment existing in the Centro de Estudos Superiores de Caxias/CESC, of the State University of Maranhão/UEMA, which is located in Morro do Alecrim (Figure

1.A-B-C-D), urban area of the municipality of Caxias/Maranhão/Brazil, among the geographic coordinates, latitude 04° 51' 93" South and longitude 43° 21' 28'' to the west, with an altitude of 275m, which is the highest point in the city. Its slopes display a beautiful vegetation cover, with typical Cerrado area, with soil, climate and characteristic vegetation.

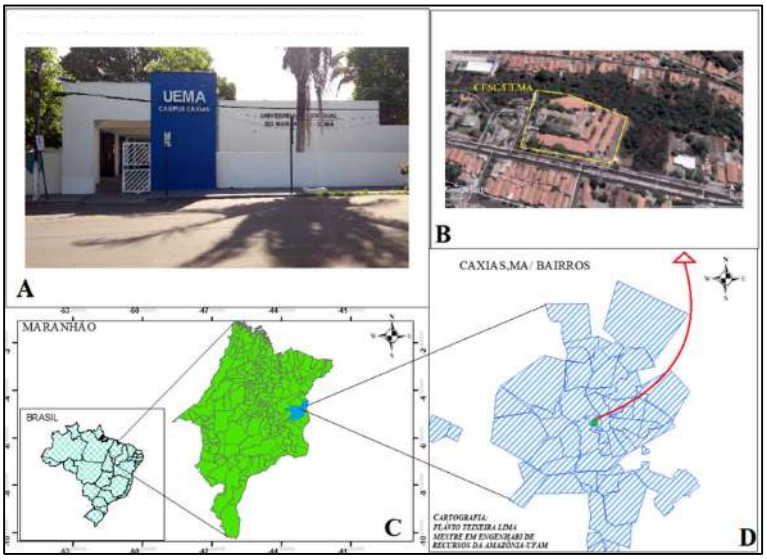

Figure 1: Location map of the CESC/UEMA/ MORRO DO ALECRIM /CAXIAS/MA. A and B. CESC/UEMA Campus. C. Map of Maranhão. D. Map of Caxias with location of Morro do Alecrim/Campus CESC/UEMA. Source: Figure A Authors of the chapter. Figure B Google maps. Figure C and D Flávio Teixeira Lima.

Collect, herborization and identification of the plant species

The collection of medicinal plants found in the Cerrado fragment, CESC/UEMA, occurred between August 2018 and July 2019 following usual methodology of Fidalgo; Bononi (1989). During the field collections, data on the date, place, habit and other characteristics of the plants were recorded. The identification of the species occurred with the help of specialized literature, identification key and expert botanists. The classification system adopted was APG IV (2016) for Phanerogams and PPG I (2016) for Cryptogams. Subsequently, the material properly herborized and labeled was incorporated into the Herbarium Profº Aluízio Bittencourt/HABIT, Centro de Estudos Superiores de Caxias in State University of Maranhão. Ethnobotanical and medicinal data of the species were informed for each species, following the sequence: scientific name, Common name, part used, forms of use, therapeutic indications and bibliographic sources.

RESULTS AND DISCUSSION

The research presented 70 species, distributed in 58 genera and 28 botanical families. Among the related groups, only one species of cryptogam was recorded (*Lygodium venustum* Sw.- Lygodiaceae), while the other species are represented by phanerogamic plant families. The families of phanerogams were distributed according to the number of species: Fabaceae (16 species), Convolvulaceae and Malvaceae (seven species), Euphorbiaceae (six species), Asteraceae and Rubiaceae (three species), while Amaranthaceae, Apocynaceae, Cucurbitaceae., Passifloraceae, Solanaceae and Urticaceae were represented by two species

each. The families Acanthaceae, Boraginaceae, Commelinaceae, Connaraceae, Lamiaceae, Linderneaceae, Loganiaceae, Nyctaginaceae, Plantaginaceae, Phyllanthaceae, Smilacaceae, Talinaceae, Verbenaceae and Vitaceae each had one species. The most representative genera were: *Euphorbia* L. (Euphorbiaceae), *Ipomoea* L. (Convolvulaceae), *Mimosa* L. (Fabaceae), *Sida* L. (Malvaceae), with three species each; *Altenanthera* Forssk. (Amaranthaceae), *Croton* L. (Euphorbiaceae), *Centrosema* (DC.) Benth. and *Senna* Mill. (Fabaceae), with two species each.

Plants species and their Therapeutic indication

***Elytraria imbricata* (Vahl) Pers.:** Family: Acanthaceae; Common name: Folha da Gentileza; Part used: Root, stem, leaf; Form of use: Decoction; Therapeutic indication: Diarrhea, contra-venom (scorpion bite), kidney pain (PÉREZ et al., 2015).

***Alternanthera brasiliana* (L.) Kuntze.:** Family: Amaranthaceae; Common name: Anador, melhoral, caaponga, cabeça-branca, carrapichinho, quebra-panela, sempre-viva, doril, perpétua-do-brasil, terramicina, sempre-viva; Part used: Whole plant, leaf, flower; Form of use: Infusion, Decoction and Maceration; Therapeutic indication: Bladder, liver, hemorrhoid, pain, antidiarrheal, constipation, diuretics, depurative influenza, cold, sore throat; (SILVA et al., 2011; PLANTAMED, 2018).

***Alternanthera tenella* Colla.:** Family: Amaranthaceae; Common name: Apaga fogo, periquito, corrente, perpétua do campo; Part used: Whole plant; Form of use: Decoction; Therapeutic indication: Headaches and fevers (VENDRUSCOLO et al., 2005; NASCIMENTO, 2014).

***Schubertia grandiflora* Mart.:** Family: Apocynaceae; Common name: Maria-da-costa; Part used: Stem (Tuber); Form of use: Not found; Therapeutic indication: Abortive (SANTOS et al., 2013).

***Prestonia bahiensis* Müll. Arg.:** Family: Apocynaceae; Common name: Cipó cabeludo, gitirana, pau darco; Part used: Flower; Form of use: Not found; Therapeutic indication: Treat kidney problems, back pain, tranquilizer (MORALES, 2017).

***Centratherum punctatum* Cass.:** Family: Asteraceae; Common name: Perpétua-roxa-do-mato, vassourinha-roxa, perpétua-brava-do-mato, perpétua-do-mato, melosa, aletria e suspiro-de-cachorro, contra-veneno, placari; Part used: Leaf; Form of use: Sumo (internal and external); Therapeutic indication: Snake bite (VÁSQUEZ et al., 2014; CARVALHO, 2012).

***Cyanthillium cinereum* (L.) H. Rob.:** Family: Asteraceae; Common name : Erva de ferro, vassourão, trombe; Form of use: Decoction, infusion; Therapeutic indication: Asthma, cancer, cholera, colic, cough, diarrhea, dysentery, impotence, night blindness; anthelmintics, treatment of leprosy, chronic skin diseases, analgesic, antipyretic, scorpion bite antidote and snake, malaria, fever, worms, pain, infections, diuresis, cancer, abortion, gastrointestinal disorder (GUHA et al., 2011; KUMAR et al., 2009).

***Tridax procumbens* L.:** Family: Asteraceae; Common name: Erva-de-touro; Part used: Leaf; Form of use: Decoction, infusion; Therapeutic indication: Anticoagulant, antifungal, insect repellent, phlegm, diarrhea, dysentery, wound healing, promotes hair growth, liver disorders, leishmaniasis (BHAGWAT et al., 2008; CERQUEIRA et al., 2002).

***Heliotropium indicum* L.:** Family: Boraginaceae; Common name: Crista-de-Galo, cravo-de-urubu, fedegoso, erva-de-são-fiacre; Part used: Root, leaf, flower; Form of use: Decoction; Therapeutic indication: Thrush, stomatitis, throat and pharyngeal ulcerations (LORENZI et al., 2008).

***Commelina benghalensis* L.:** Family: Commelinaceae; Common name: marianinha; Part used: Leaf; Form of use: Decoction; Therapeutic indication: Anticephalic, diuretic (MESSIAS, 2015).

***Rourea doniana* Baker.:** Family: Connaraceae; Common name : Not Found; Part used: Stem, leaf; Form of use: Extract; Therapeutic indication: Antioxidant, promising activity of hexane stem extract against *Aedes aegypti* larvae, being a potential agent against the dengue-transmitting mosquito, a disease that affects several regions of Brazil (OLIVEIRA et al., 2010; OLIVEIRA, 2011).

***Distimake aegyptius* (L.) A.R. Simões & Staples.:** Family: Convolvulaceae; Common name: Corda-de-viola, batatão roxo, jetirana-de-batata, jetirana-cabeluda, jetirana; Part used: Stem, leaf, seed; Form of use: Extract; Therapeutic indication: Antimicrobial against *Escherichia coli*, *Pseudomonas putida*, *Bacillus thuringiensis*, *B. subtilis*, *Candida albicans* and *Aspergillus niger*, diabetes, wounds, infections and tumors (JOSHI et al., 2015; OMOTAYO et al., 2012).

***Evolvulus nummularius* (L.) L.:** Family: Convolvulaceae; Common name : Aakhukarni, Muusaakarni and Chhinipatra; Part used: Whole plant; Form of use: metabolic extracts; Therapeutic indication: Remedy for hysteria, to cure burns, cuts, wounds and scorpion bites, anti-helminthine, wound healing (PAVITHRA et al., 2009).

***Ipomoea asarifolia* (Desr.) Roem. & Schult.:** Family: Convolvulaceae; Common name: Salsa, batata de boi; Part used: Stem, leaf, flower; Form of use: Decoction; Therapeutic indication: Leprosy, itch, wound, toothache (Anti-inflammatory) (NETO et al., 2014; FREITAS et al., 2015).

***Ipomoea bahiensis* Willd. ex Roem. & Schult.:** Family: Convolvulaceae; Common name: Jetirana; Part used: Leaf; Form of use: Extract; Therapeutic indication: Growth inhibition of various microorganisms such as *Bacillus subtilis*, *Staphylococcus aureus*, *Neurospora crassa*, *Streptococcus faecalis*, anticancer (BIEBER et al., 1986; MEIRA et al., 2012; MAIA-SILVA et al., 2012).

***Ipomoea squamosa* Choisy.:** Family: Convolvulaceae; Common name: Not Known; Part used: Leaf; Form of use: Extract; Therapeutic indication: Has human ovarian cytotoxic activity / tested on ovarian cancer cells / in vitro (CAO et al., 2007).

***Jacquemontia tamnifolia* (L.) Griseb**.: Family: Convolvulaceae; Common name: Corda-de-viola, jetirana; Part used: Root, leaf; Form of use: Crushed foil (poultice), foil powder; leaf juice; Therapeutic indication: Headache, neuralgia, conjunctivitis, snake bite (MOREIRA, 2014).

***Operculina hamiltonii* (G. Don) D.F. Austin & Staples.:** Family: Convolvulaceae; Common name: Jalapa-brasileira, jalapa, raiz-do-jeticucu, mecoacã, batata-de-purga; Part used: Root, seed; Form of use: Infusion; Therapeutic indication: Digestive tract disorder, amoeba, difficult teething, childhood diarrhea, dysentery, gastroenteritis, haemorrhage, nosebleed, skin disorder, prevent childhood meningitis (PLANTAMED, 2019; BRAGA, 1976).

***Cayaponia tayuya* (Vell.) Cogn.:** Family: Cucurbitaceae; Common name: Taiuiá, tajujá, abobrinha-do-

mato, cabeça-de-negro; Part used: Root; Form of use: Decoction; Therapeutic indication: Pain in general, blood purifier, purgative, analgesic, erysipelas, rheumatism, ulcers, herpes, boils, analgesics, anti-inflammatory (LORENZI et al., 2008).

***Momordica charantia* L.:** Family: Cucurbitaceae; Common name: Melão-de-São-Caetano; Part used: Leaf; Form of use: Leaf extract; Therapeutic indication: Leukorrhea, antidiabetic, healing, antirheumatic, antimicrobial, diabetes, skin lesions (RODRIGUES et al., 2010; DENISE et al., 2009).

***Croton hirtus* L'Hér.:** Family: Euphorbiaceae; Common name: Malva de pelos, croto; Part used: Whole plant; Form (s) of use: Extract; Therapeutic indication: Antibacterial activities (SUBIN et al., 2012).

***Croton heliotropiifolius* Kunth.:** Family: Euphorbiaceae; Common name: Velame or velame-da-caatinga; Part used: Leaf; Form of use: Infusion; Therapeutic indication: Stomachache, stomach upset, vomiting, diarrhea (RANDAU et al., 2004; MARANGONI, 2015).

***Euphorbia heterophylla* L.:** Family: Euphorbiaceae; Common name: Leiteira; Part used: Root, leaf; Form of use: Infusion; Therapeutic indication: Headache, laxatives, anti-diarrhea, migraine, warts, anti-tumor/anti-cancer and anti-HIV (HILLOCKS, 1998; RODRIGUEZ et al., 1976; FALODUN et al., 2003).

***Euphorbia hirta* L.:** Family: Euphorbiaceae; Common name : Erva-de-Santa-Luzia; Part used: stem (latex), leaf; Form of use: Extract, maceration; Therapeutic indication: Analgesic, anti-inflammatory, antidepressant, antihypertensive, respiratory, gastrointestinal treatment, cough, runny nose, allergic rhinitis, asthma, bronchial infections, worm infestations, kidney stones (TONA et al., 1999, ANJARIA et al., 1997; ELUMALAI, 2010).

***Euphorbia prostrata* Aiton.:** Family: Euphorbiaceae; Common name: Quebra-pedra-rasteira; Part used: whole plant, leaf; Form of use: Decoction; Therapeutic indication: Kidney stones, diarrhea, wound cleaning, urinary tract infection (PLANTAMED, 2018; PILLA et al., 2006; PÉREZ et al., 2015).

***Ricinus communis* L.:** Family: Euphorbiaceae; Common name: Mamona, Carrapateiro, Carrapateiro, Castor, Palma-de-cristo, Rícino, Mamoneira, Tortago Part used: Leaf, seed; Form of use: Seed oil extract (decoction), leaf (poultice); Therapeutic indication: Treatment of rheumatic leg and foot pain, deworming, boils, ear inflammation, laxative, hair growth (LORENZI et al., 2008).

***Centrosema brasilianum* (L.) Benth.:** Family: Fabaceae; Common name: Roxinha, cunhã, Feijão-bravo; Part used: Leaf; Form of use: Not found; Therapeutic indication: Astringent, antiseptic (BRANDÃO, 1991; VIEIRA et al., 2000; OLIVEIRA et al., 2015).

***Centrosema pubescens* Benth.:** Family: Fabaceae; Common name: Ervilha borboleta; Part used: Stem, leaf, seed; Form of use: Extract; Therapeutic indication: Wound healing; (NATURE.SCIENCE LIFE, 2019; EKPO et al., 2011).

***Chamaecrista desvauxii* (Collad.) Killip.:** Family: Fabaceae; Common name: Sene do campo; Part used: Leaf, fruit (pod); Form of use: Decoction (tea); Therapeutic indication: Abortion and postpartum lavage (BERG et al., 1988).

***Crotalaria retusa* L.:** Family: Fabaceae; Common name: Amendoim bravo, chique-chique, guiso de cascável; Part used: Seed; Form of use: Flour from seed; Therapeutic indication (s): Anti-inflammatory and

antinociceptive (reduction in the ability to perceive pain) (ARAGÃO, 2016).

***Desmodium triflorum* (L) DC.:** Family: Fabaceae; Common name: Trevo de carrapato de três-flor, mendigo de três flores; Part used: Whole plant, root, leaf; Form of use: Decoction, poultice; Therapeutic indication: Heat stroke, diarrhea, vomiting, fever, injuries, skin problems, diuretic, mouthwash (FERN et al., 2014; MILKYLANE, 2008; WANG et al., 1994; GAN , 1967; ILANDARA et al., 2015).

***Dioclea bicolor* Benth.:** Family: Fabaceae; Common name: Pucumã; Part used: Seed; Form of use: Sympathies; Therapeutic indication: The use in the pocket to cure cramps (COSTA et al., 2006).

***Indigofera suffruticosa* Mill.:** Family: Fabaceae; Common name: Índigo, anileira; Part used: Root, stem, leaf; Form of use: Infusion, Decoction; Therapeutic indication: Diuretic, abortive, analgesic, against urinary and stomach problems, ulcers, purgative, sedative (PESAVENTO, 2005; MATOS, 1999; HASTINGS, 1990; VIEIRA, 1992; MARTINS, 2000).

***Leucaena leucocephala* (Lam.) From Wit.:** Family: Fabaceae; Common name : Leucaena; Part (s) used: Leaf, seed; Form (s) of use: Extract; Therapeutic indications: Antidiabetic, antibacterial, antihemothetic, cancer preventive, diuretic, nematicide, stomach ache, abortion (ZAYED et al., 2018; DEVI et al., 2013; BREWBAKER et al., 1990; ZAYED et al., 2016; NAS, 1984).

***Mimosa arenosa* (Willd.) Poir.:** Family: Fabaceae; Common name: Unha-de-gato; Part used: Root; Form of use: Lambedor; Therapeutic indication: Influenza, cough (against cough) (SILVA et al., 2015).

***Mimosa pudica* L.:** Family: Fabaceae; Common name: Dormideira, sensitiva, dorme-dorme, não-me-toque, malícia, Maria-fecha-a-porta, malícia-roxa; Part used: Whole plant; Form of use: Decoction; Therapeutic indication: Treatment of diabetes, antitoxin, anti-hepatotoxin, antioxidant, wound healing, leprosy, dysentery, vaginal and uterine complaints, inflammation, burning sensation, fatigue, asthma (JOSEPH et al., 2013).

***Mimosa sensitiva* L.:** Family: Fabaceae; Common name: Malícia; Part used: Root; Form of use: Syrup, licking; Therapeutic indication: influenza, cough (against cough) (SILVA et al., 2015).

***Desmodium incanum* (Sw.) DC.:** Family: Fabaceae; Common name: Carrapicho-beiço-de-boi; Part used: Root, leaf; Form of use: Infusion; Therapeutic indication: Antigonorrhea, ovarian problems, asthma, bronchitis, kidney disorders, yellowing, diuretics, kidney problems, blood problems, kidney, bladder, prostate (FLORASBS, 2019).

***Senna cana* (Nees & Mart.) H.S. Irwin & Barneby**.: Family: Fabaceae; Common name: São João; Part used: Leaves; Form of use: Extract; Therapeutic indication: In vitro test showed leishmanicidal activities (SARAIVA et al., 2016).

***Senna obtusifolia* (L.) H.S. Irwin & Barneby.:** Family: Fabaceae; Common name : Mata-pasto; Part used: Root, Leaf, Seed; Form of use: Decoction; Therapeutic indication: Laxative, eye inflammation, dizziness, diarrhea, urinary tract, dysentery, stomach ache, headache (DIRAR, 1984; GUO et al., 1998; ZAFAR, 1994; DOUGHARI et al., 2008 ; ANISUZZAMAN et al., 2014).

***Senegalia polyphylla* (DC.) Britton & Rose.**: Family: Fabaceae; Common name: Arranha-gato, unha de gato; Part used: Leaf; Form of use: Not found; Therapeutic indication: For fever (DAVID et al., 2015;

MARREIROS et al., 2015).

***Zornia latifolia* Sm.:** Family: Fabaceae; Common name: Arrozinho, zornia, tencilla; Part used: Leaf, flower, seed (pea); Form of use: Decoction; Therapeutic indication: Inflammation, Relaxation, Sedative, Anxiety (DIXITA et al., 2015).

***Marsypianthes chamaedrys* (Vahl) Kuntze.:** Family: Lamiaceae; Common name : Hortelã-do-campo, erva-do-pacari, hortelã-do-brasil, betônia-brava; Part used: Whole plant, root; Form of use: Decoction; Therapeutic indication: Diarrhea, snake bite, headache, anti-inflammatory, analgesic, carminative, joint rheumatism, anemia (LORENZI et al., 2008).

***Linderna crustacea* (L.) F. Muell.:** Family: Linderneaceae; Common name: Douradinha-do-campo; douradinha-do-Pará, matacana, matucana; orelha-de-rato; Part used: Whole plant; Form of use: Infusion, decoction; Therapeutic indication: Dysentery, diarrhea, vomiting, amenorrhoea, boil, itching, herpes, sores, worms (FERN et al., 2014; PANDA et al., 2011; SOUZA et al., 2009).

***Spigelia anthelmia* L.:** Family: Loganiaceae; Common name: Erva-lombrigueira, lombrigueira ou arapabaca; Part used: Whole plant; Form of use: Infusion, decoction; Therapeutic indication: Prevention and treatment of worm problems (BASÍLIO et al., 2003; GIRÃO et al., 2004; LORENZI et al., 2008).

***Lygodium venustum* Sw.:** Family: Lygodiaceae; Common name: Culebrina, grama de víbora, videira chinesa, crispillo, grama de conversação, ninho de papa, pesma; Part used: Leaf; Form of use: Extract (ethanolic); Therapeutic indication: Antioxidant, antibacterial, antifungal bioactivities, gastrointestinal disorders, infections, dermatoses and parasitic diseases such as trichomoniasis (BRAGA, 2012; TEIXEIRA et al., 2015).

***Corchorus aestuans* L.:** Family: Malvaceae; Common name: Juta; Part used: Root, Leaf, Seed; Form of use: Extract; decoction, powder; Therapeutic indication: Gonorrhea, urethra, headache, fever, stomach problems, anti-inflammatory, pneumonia (N'DANIKOU et al., 2011; KHARE, 2007; AL-SNAFI, 2016).

***Melochia pyramidata* L.:** Family: Malvaceae; Common name: Relógio rosa; Part used: Leaf; Form of use: Decoction; Therapeutic indication: Against cough, bronchitis, urinary tract infection (RAMOS et al., 2018; AGRA et al., 2007; SAMOISY et al., 2016).

***Pavonia cancellata* (L.) Cav.:** Family: Malvaceae; Common name: Malva-rasteira, corda-de-viola; Part used: Leaf; Form of use: Poultice; Therapeutic indication: Boil (AGRA et al., 2007).

***Sida acuta* Burm.f.:** Family: Malvaceae; Common name: Malva-baixa, guaxuma, relógio, tupiticha, vassoura, vassourinha; Part used: Whole plant; Form of use: Infusion, extraction; Therapeutic indication: Fever, headache, skin disease, diarrhea, dysentery (FLORASBS, 2019; KAROU et al., 2007; KUMAR et al., 2013).

***Sida ciliaris* L.:** Family: Malvaceae; Common name: Vassoura; Part used: Whole plant; Form of use: Decoction, infusion; Therapeutic indication: Expectorant and anti-inflammatory (CARMONA et al., 2008).

***Sida spinosa* L.:** Family: Malvaceae; Common name: Guanxuma-de-espinho, guanxuma, malvinha, malva-lanceta, vassourinha-de-relógio; Part used: Whole plant, root, leaf, fruit; Form of use: Decoction and infusion; Therapeutic indication: Ulcers, pain, asthma, burning sensation, skin disease, snake bite, gonorrhea,

diarrhea, dysentery (FLORASBS, 2019; SHARMA, 2018).

***Waltheria indica* L.:** Family: Malvaceae; Common name: Malva-branca, malva-veludo; Part used: Whole plant; Form of use: Decoction or infusion; Therapeutic indication: Dysentery, catarrh-bronchial, lung disorders, bladder inflammation, cough, bronchitis, syphilis, wound care (LORENZI et al., 2008).

***Boerhavia diffusa* L.:** Family: Nyctaginaceae; Common name: Pega-pinto, agarra-pinto, bredo-de-porco, erva-de-porco, batata-de-porco, tangaracá, erva-tostão; Part used: Whole plant, root; Form of use: Decoction, poultice; Therapeutic indication: Hepatitis, jaundice, gallstones, kidneys, diuretics, snake bite, liver (LORENZI and MATOS, 2008).

***Passiflora glandulosa* Cav.:** Family: Passifloraceae; Common name: Maracujá-do-mato; Part used: Leaf, fruit, seed; Form of use: Consumption in natura (pulp extract); Therapeutic indication: Sources of antioxidants may have hypoglycemic effect (LIMA-NETO et al., 2017).

***Turnera subulata* Sm.:** Family: Passifloraceae; Common name: Chanana; Part used: Root, leaf, flower; Form of use: Infusion, edible plant; Therapeutic indication: Liver, anti-inflammatory, against Acquired Immunodeficiency Syndrome (AIDS) (MADALENO, 2011; KINUPP et al., 2014).

***Scoparia dulcis* L.:** Family: Plantaginaceae; Common name: Vassourinha-de-botão, vassourinha-doce, vassourinha-mofina, vassourinha; Part used: Whole plant; Form of use: Decoction, infusion, juice; Therapeutic indication: Fever, cough, bronchitis, diarrhea, inflammation, toothache, stomach, hemorrhoids, insect bites, antidiabetic (LORENZI et al., 2008).

***Phyllanthus niruri* L.:** Family: Phyllanthaceae; Common name: Quebra-pedra, arrebenta-pedra, erva-pombinha Part used: Whole plant; Form of use: Decoction or infusion; Therapeutic indication: Urinary tract (renal calculus), fight against hepatitis B virus, assist in the elimination of uric acid (LORENZI et al., 2008).

***Bredemeyera floribunda* Willd.:** Family: Polygalaceae; Common name: Pau-caixão, pau-gemada, cabão-de-bugre, laça-vaqueiro, marfim-de-rama, pau-rendoso, raiz-de-cobra, raiz-de-são-joão-da-costa;Part used: Root; Form of use: Tincture, decoction, infusion; Therapeutical indication: Anti-allergic, anti-inflammatory action against bee stings, spiders, scorpions, irritation by stinging plants, dermatitis, catarrhal bronchitis, boils (MARONI et al., 2006; LORENZI et al., 2008).

***Borreria verticillata* (L.) G. Mey.:** Family: Rubiaceae; Common name: Cordãozinho-de-frade, erva-botão, erva-de-lagarto, falsa-poaia, perpétua-do-mato, poaia, poaia-comprida, poaia-falsa, poaia-preta, poaia-rosário, vassoura-botão, vassourinha Part used: Root, leaf; Form of use: Infusion, decoction, poultice or plaster (for burns); Therapeutic indication: Vomiting, diuretic, childhood diarrhea, hemorrhoids, varicose veins, burns (LORENZI et al., 2008).

***Richardia grandiflora* (Cham. & Schltdl.) Steud.:** Family: Rubiaceae; Common name: Poaia-rasteira, poaia-da-praia, poaia-rósea, asa-de-pato, ipema-mirim, poaia, ipecacuanha-do-campo, ervanço; Part used: Root; Form of use: Decoction; Therapeutic indication: Bronchitis, phlegm, diarrhea and teething, hemorrhoids vermicide (SOUZA et al., 2013).

***Oldenlandia corymbosa* L.:** Family: Rubiaceae; Common name: Erva- diamante; Part used: Whole plant; Form of use: poultice, decoction and juice; Therapeutic indication: Activate blood circulation, promote

diuresis, relieve stranguria (urinary obstruction), digestive tract lymphosarcoma tumors, liver and larynx carcinoma. It is also active against appendicitis, hepatitis, pneumonia, cholecysthesis, urinary tract infection, cellulitis and snake bite (PATEL et al., 2014).

***Smilax cissoides* Mart. Ex Griseb.:** Family: Smilacaceae; Common name : Sarsaparilla, japecanga; Part used: Stem, leaf; Form of use: Decoction; Therapeutic indication: Diuretic, diaphoretic, apperetic, eupeptic, emollient, expectorant, antileprous, myotonic, sudorific, treatment of syphilis, against eczema, wart, boils, rheumatism, arthritis, vesicular and renal disorders (MEDEIROS et al., 2007; NARDELLI, 2005).

***Physalis angulata* L.:** Family: Solanaceae; Common name: Camapu, camapum, joá–de-pacote, balão; Part used: Root, Leaf, Fruit; Form of use: Infusion, decoction; Therapeutic indication: Anti-inflammatory, skin disease disinfectant, diabetes, chronic rheumatism, kidney problems, bladder, liver, sedative, antifebrile, anti-inflammatory, cytotoxic action for various types of cancer cells, antiviral activity, including against HIV and HSV-1 causing cold sores (LORENZI et al., 2008).

***Solanum lycocarpum* A.St.-Hil.:** Family: Solanaceae; Common name: Fruta-de-lobo, berinjela-do-mato, jurubebão, baba-de-boi, capoeira-branca, lobeira; Part used: Leaf, flower, fruit; Form of use: Decoction, fruit juice; Therapeutic indication: Diuretic, soothing, antiepileptic, urinary tract infection, abdominal and renal colic and hemorrhoids, diabetes, cholesterol lowering, epilepsy, asthma, flu, cold (LORENZI et al., 2008; MARONI et al., 2006).

***Talinum fruticosum* (L.) Juss.:** Family: Talinaceae; Common name: João-gomes, folha d'água; Part used: Aerial part (stem, leaf, flower, fruit, seed); Form of use: Extract; Therapeutic indication: Polyuria, internal heat, measles, anti-inflammatory, gastrointestinal disorders (CHAN et al., 2016).

***Cecropia pachystachya* Trécul.:** Family: Urticaceae; Common name: Embaúba, pau-de-lixa; Part used: Stem marrow, leaf; Form of use: Decoction, Natural sap of the stem; Therapeutic indication: Kidney, anemia, anti-inflammatory, antihypertensive stones (BIRTH et al., 2011; LORENZI et al., 2008).

***Laportea aestuans* (L.) Chew.:** Family: Urticaceae; Common name: Urtiga, urtiga vermelha, cansanção Part used: Leaf; Form of use: Decoction; Therapeutic indication: Diabetes mellitus, reproductive problems such as infertility, menstruation, shortening labor, anemia, fibroids, dermatitis, low calcium (LANS et al., 2006; LANS et al., 2007; JIOFACK et al., 2009).

***Lantana camara* L.:** Family: Verbenaceae; Common name : Camará-de-cheiro e camará de chumbo; Part used: Root, leaf, flower; Form of use: Decoction, infusion; Therapeutic indication: Treatment of itching, stomachache, toothache, rheumatism, cutting, flu, asthma, bronchitis and antiseptic, for bathing, antimalarial, antimicrobial (fungal and bacterial) scabies (BEZERRA et al., 2016; LORENZI et al., 2008; MARONI et al., 2006).

***Cissus verticillata* (L.) Nicolson & C.E. Jarvis.:** Family: Vitaceae; Common name: Insulina-vegetal; uvinha, uva–brava; Puçá; Part used: Root, stem, leaf; Form of use: Juice, infusion; Therapeutic indication: Heart problems, anemia, rheumatism, anticonvulsant, antidiabetic, intestine (CORRÊA, 1926; ALMEIDA et al., 1994; SILVA et al., 1994; POTT et al., 1994; LORENZI et al., 2008; SOUZA et al., 2009).

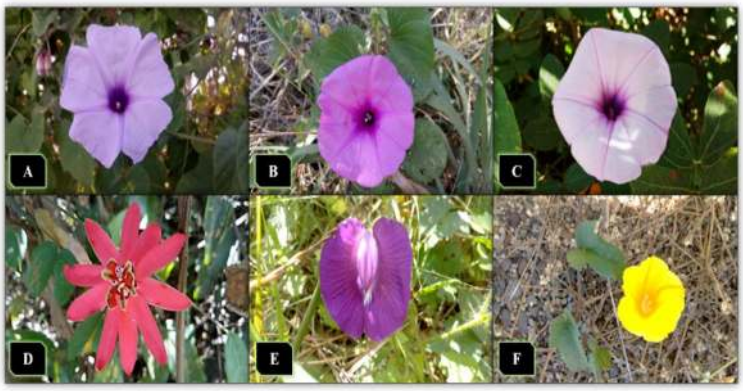

Figure 2: Plant species found in Morro do Alecrim/Caxias/MA A - *Ipomoea bahiensis* Willd. ex Roem. & Schult. B - *Ipomoea asarifolia* (Desr.) Roem. & Schult. C - *Ipomoea squamosa* Choisy. D - *Passiflora glandulosa* Cav. E - *Centrosema brasilianum* (L.) Benth. F- *Operculina hamiltonii* (G. Don) D.F. Austin & Staples.

Figure 3: Plant species found in Morro do Alecrim/Caxias/MA. A - *Sida ciliares* L. (A). B - *Pavonia cancellata* (L.) Cav. C - *Momordica charantia* L. D - *Corchorus aestuans* L. E -*Commelina benghalensis* L. F - *Ricinus communis* L.

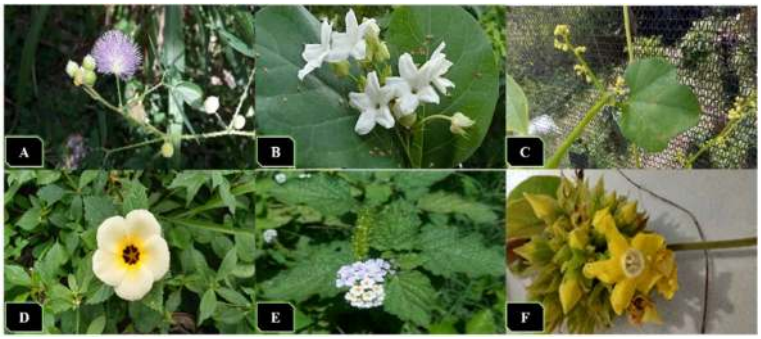

Figure 4: Plant species found in Morro do Alecrim/Caxias/MA. A - *Mimosa sensitiva* L.; B - *Schubertia grandiflora* Mart. C - *Cayaponia tayuya* (Vell.) Cogn. D - *Turnera subulata* Sm. E-*Heliotropium indicum* L. F - *Prestonia bahiensis* Müll.Arg.

Figure 5: Plant species found in Morro do Alecrim/Caxias/MA. A - *Spigelia anthelmia* L. B - *Tridax procumbens* L. C - *Linderna crustacea.* D - *Euphorbia heterophylla* L. E - *Crotalaria retusa* L. F - *Croton heliotropiifolius* Kunth.

CONCLUSIONS

The research contributed to increase the number of plant species, with medicinal information in Maranhão/Brazil, where many species were indicated as useful for the treatment of common diseases such

as influenzas, urinary infections, headaches, dysentery, among others. The knowledge and indication of these medicinal plants to cure diseases are important tools in the discovery of new drugs, as well as being the basis for new research.

Despite the various medicinal and ethnobotanical knowledge, there are still many plant species that have no phytochemical studies. Thus, it is important to mention that there is a need for further studies of this nature, for the knowledge of medicinal plants, and thus, to verify their efficiency to cure diseases, since some plants may have secondary metabolites that may be toxic. humans when used in large quantities. Even so, it is worth emphasizing the importance of preserving urban plant fragments and the researched area, to ensure plant diversity, with medicinal purposes, as well as being subsidies for future research on the medicinal flora of Maranhão/Brazil.

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