Ethnobotany applied to the selection of medicinal plants for agroecological crops in rural communities in the Southern End of Bahia, Brazil


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Abstract

The present work targeted the ethnobotanical survey of medicinal plants for introduction to agroecological crops in 9 rural communities in the southern end of the state of Bahia, Brazil, as an economic and therapeutic alternative for the local populations. Prior agreement from the communities was requested and the research was submitted to the ethics committee; the registration of access to genetic heritage and associated traditional knowledge was performed. The following methodologies were used: participant observation, “snowball”, “walking in the woods”; semi-structured questionnaires and calculation of the Main Uses Concordance index (CUPc). The species were evaluated according to their origin and degree of threat. 233 species, distributed in 73 families, were cited, with emphasis on Asteraceae (27 spp.), Fabaceae (18 spp.) and Lamiaceae (16 spp.). Among these, 48% are native, 52% are naturalized and/or exotic and one vulnerable species was found (Euterpe edulis Mart.) and one endangered (Cariniana legalis (Mart.) Kuntze). The CUPc revealed 25 spp. with a value equal to or greater than 50% in at least one community. These results are expected to contribute to the selection of medicinal plants that serve as an economic and therapeutic alternative for vulnerable communities, as well as in stimulating the preservation of sociobiodiversity.

Keywords: Phytotherapy. Popular medicine. Sociobiodiversity. Traditional knowledge.
**Introduction**

Since the beginning of human civilization, medicinal plants have been used as resources in the treatment of diseases aiming at their prevention or even the cure. The empirical knowledge about the use of these plants has been passed down until today, becoming a common practice in popular medicine\[1,2\].

Although the use of medicinal plants is recurrent in popular medicine, only recently the pharmaceutical area has turned its attention to the subject. Until the mid-1980’s, the pharmaceutical industry produced medicines by means of the recognition, isolation and synthesis of molecules. However, starting in the 1990s, due to the high cost of producing these drugs and the discovery of phytocomplexes, a movement began for the valorization of the traditional use of medicinal plants, as well as the development of herbal medicines\[3-5\].

This valorization process was strengthened in Brazil with the implementation of the National Policy on Medicinal Plants and Herbal Plants (PNPMF)\[6\] which aims to promote actions, mainly focused on Sistema Único de Saúde (SUS) (Unified Health System), aimed at safe and rational use of medicinal plants and herbal medicines. Specific legal instruments have also been created, such as the Resolution of the Collegiate Board of ANVISA - RDC nº 26\[7\] that defines the categories of herbal medicines and traditional herbal products in addition to establishing the minimum requirements for their registration.

Even with the advent of SUS, the use of medicinal plants represents, in several Brazilian communities, the role of a sole therapeutic resource. It is believed that this practice is beneficial to human health, as long as the user has prior knowledge of its purpose, risks and benefits\[8\].

This scenario has been favoring ethnobotany research focused on the area of medicinal plants. According to Fonseca-Kruel et al.\[9\], this discipline can subsidize works on the sustainable use of biodiversity, through the utilization and valorization of the popular knowledge of human societies. Almassy Jr.\[10\] considers that ethnobotany, besides having a multi and interdisciplinary character, seeks, together with traditional communities, comprehension of human relations with the environment and can recover management strategies. The importance of these studies, in this context, allows the recording of information connected to ethnopharmacology, as well as the environmental preservation of the different medicinal species used\[11\].

It is worth mentioning that, together with these conditions, rural settlements are areas whose populations are composed of people from different regions of the country and, therefore, rich in sociobiodiversity. Thus, ethnobotanical studies also allow an evaluation of how the residents gather information brought from their places of origin with that obtained in the place where they have settled in order to adapt, in this new environment, the plants that are useful to their needs\[12\].

In the southern region of the state of Bahia, some of the last fragments of the remaining Brazilian Atlantic Rainforest are concentrated, in addition to several rural communities that live in isolation from the great urban centers, representing a space for research on the traditional knowledge focused on medicinal plants species.

Despite the ecological importance of the Atlantic Rainforest areas, associated with the rich sociobiodiversity, there is very little information about the potential and dynamics of these fragments. This knowledge gap is one of the causes of the slowness in the search for medicines that have long been part of the therapy of traditional communities, not to mention the fact that the value of medicinal resources derived from plants has significant potential as an alternative economic resource for the communities in the region\[13\].
In view of the issues presented, the purpose of the present work was to carry out an ethnobotanical survey in rural communities and agrarian reform settlements in the southern end region of Bahia, aiming at the selection of medicinal plants to be inserted in agroecological cultivation systems as an economic and therapeutic alternative for the local populations.

**Methods**

**Areas of study**

The areas of study were chosen when the Center for Innovation in Biodiversity and Health (CIBS/Farmanguinhos/Fiocruz) was invited to participate in the Agroecological Settlements Project (PAA), articulated between the Landless Rural Workers Movement (MST) and the Support Center for Culture and Extension in Education and Environmental Conservation at the Luiz de Queiroz Superior School of Agriculture of the University of São Paulo (NACE PTECA – ESALQ/USP).

CIBS was responsible for selecting plant species of medicinal interest with the purpose of inserting them into productive systems of the MST agroecological settlements (Bela Manhã, José Martí, Antônio Araújo, Jaci Rocha, Herdeiros da Terra, Abril Vermelho e São João) and in two rural communities (Ribeirão and Pouso Alegre). These areas are distributed in four municipalities in the southern end of Bahia: Itamaraju, Alcobaça, Prado and Teixeira de Freitas.

The southern end of Bahia is a region that is classified by the State of Bahia both as an identity territory, due to its cultural diversity, and as one of the main economic regions of the state. The southern end is composed of twenty one municipalities and its borders are demarcated as follows: to the North, Southwest of Bahia and the South Coast of Bahia; to the South, with the State of Espírito Santo; to the West, with the State of Minas Gerais; and, to the East, with the Atlantic Ocean.

This region is also known for its low Human Development Index (IDH), economies based on agriculture, monoculture of eucalyptus and problems with unemployment and violence. The monitoring of health conditions shows a large proportion of rural deaths without medical assistance, making clear the lack of inclusion of these communities in public health policies.

**Sampling and data analysis**

The data were collected from June 2016 to June 2017. At the beginning of the work, a meeting was organized with each of the nine communities in order to present the project and its objectives. In these meetings, the statement of prior consent was presented, and the consent of the community was also requested for the development of the work.

The project was submitted to the Research Ethics Committee of the Oswaldo Cruz Institute (IOC) of Fiocruz (Resolution 196/96 of the National Health Council) through Plataforma Brasil, and was approved and registered as CAAE: 56440416.6.000.5248. Since the project accesses genetic patrimony (PG) and Associated Traditional Knowledge (TK), according to Law 13,123/2015, it was also registered in the National Management System for Genetic Patrimony and Associated Traditional Knowledge (SISGEN) of the Management Council for Genetic Patrimony, receiving the following registration: AA79350.
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The selection of respondents to carry out the ethnobotanical survey began through indications from the communities in the first meetings and then proceeded with the snowball method.[16]

In the fieldwork, aiming to collect information on medicinal plants and socioeconomic aspects of the communities, direct observation[17] was applied along with semi-structured interviews based on a form. The collection of plant species was carried out after the interviews, with the respondents follow-up, using the "walking in the woods" method [18,19]. The plant species were herborized, assembled, identified and incorporated into the herbarium: Fiocruz’s Botanical Collection of Medicinal Plants (CBPM). The botanic identifications were performed by comparison with the material deposited at CBPM; In the herbarium of the Botanical Garden of Rio de Janeiro (RB); by consulting the relevant literature and specialists.

The spelling of the scientific names was checked using the database of *Flora do Brasil 2020*[20]. For the listing of the taxa, the APG IV (2016)[21] was followed.

In order to understand the relationship between conservation and indication of medicinal plants, we sought to classify the species according to their origin and degrees of threat by consulting the database of *Flora do Brasil 2020*[22] and of National Flora Conservation Center (CNCFlora), respectively[23].

Aiming to select, among the total species of the survey, which should be indicated for insertion in agroecological productive systems, we chose to favor the ones that presented the highest rate of Main Uses Concordance index (CUPc)[23]. The final selection included species with a CUPc equal to or greater than 50% in at least one of the communities studied and was later compared with the list of medicinal plants of interest to the Unified Health System (Renisus)[24].

**Results and Discussion**

Altogether, 180 people were interviewed, citing 233 species of medicinal plants distributed in 73 botanical families (*TABLE 1*), and the most representative ones were: Asteraceae (27 species); Fabaceae (18 species); Lamiaceae (16 species); Euphorbiaceae (9 species); Solanaceae (9 species) e Myrtaceae (8 species). According to Guarim Neto et al.[25], the greater the number of species in a botanical family, the greater the possibility that they will be used by human populations using flora resources. Galvão et al. [26], however, believe that this probability can increase according to the presence of a great number of species of economic importance or of easy harvesting of the parts used, mainly for medicinal purposes. Consequently, the tendency of the presence of the Asteraceae, Fabaceae and Lamiaceae families can be justified among the most cited families in a large part of the ethnobotany works involving medicinal plants.

**TABLE 1:** List of species cited by the respondents: Botanical Family/Scientific Names; Use Indication and Popular Name.

<table>
<thead>
<tr>
<th>Botanical Family / Scientific Names</th>
<th>Use Indication</th>
<th>Popular Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acanthaceae</td>
<td></td>
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<tr>
<td>Justicia gendarussa Burm.f.</td>
<td>body aches</td>
<td>abre-caminho</td>
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<tr>
<td>Justicia pectoralis Jacq.</td>
<td>fever, flu, body aches</td>
<td>anador, imburaninha</td>
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<tr>
<td>Adoxaceae</td>
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<td></td>
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<tr>
<td>Sambucus nigra L.</td>
<td>chickenpox, measles, bronchitis</td>
<td>sabugueiro</td>
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<tr>
<td>Alismataceae</td>
<td></td>
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<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>Disease/Condition</td>
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<td>-----------------------------------------------------</td>
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<td>------------------------------------------</td>
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<tr>
<td>Echinodorus grandiflorus (Cham. &amp; Schltdl.) Micheli</td>
<td>urinary tract problems</td>
<td>chapéu-de-couro</td>
</tr>
<tr>
<td>Amaranthaceae</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternanthera brasiliana (L.) Kuntze</td>
<td>anti-inflammatory, antibiotic, colic</td>
<td>novalgina</td>
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<tr>
<td>Amaranthus viridis L.</td>
<td>anemia</td>
<td>caruru</td>
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<tr>
<td>Celosia argentea L.</td>
<td>throat inflammation</td>
<td>crista-de-galo</td>
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<tr>
<td>Dysphania ambrosiodes (L.) Mosyakin &amp; Clemants</td>
<td>fever</td>
<td>perpétua</td>
</tr>
<tr>
<td>Gomphrena globosa L.</td>
<td>fever</td>
<td>perpétua</td>
</tr>
<tr>
<td>Pfaffia glomerata (Spreng.) Pedersen</td>
<td>fever, flu, headache</td>
<td>doril</td>
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<td>Amaryllidaceae</td>
<td></td>
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<tr>
<td>Allium sativum L.</td>
<td>expectorant</td>
<td>alho</td>
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<tr>
<td>Allium cepa L.</td>
<td>expectorant</td>
<td>cebola</td>
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<tr>
<td>Anacardiaceae</td>
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<tr>
<td>Anacardium occidentale L.</td>
<td>anti-inflammatory, wound healing and gastric problems</td>
<td>cajú</td>
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<tr>
<td>Mangifera indica L.</td>
<td>expectorant, accelerate labor</td>
<td>manga</td>
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<tr>
<td>Schinus terebinthifolia Raddi</td>
<td>anti-inflammatory, wound healing and skin allergy</td>
<td>aroeira</td>
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<tr>
<td>Spondias cf. tuberosa Arruda</td>
<td>pains and bone fracture treatment</td>
<td>amesca</td>
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<tr>
<td>Tapirira guianensis Aubl.</td>
<td>thrush (Candida albicans)</td>
<td>cupuba</td>
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<tr>
<td>Annonaceae</td>
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<tr>
<td>Annona muricata L.</td>
<td>diuretic, control high blood pressure and, diabetes</td>
<td>graviola</td>
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<tr>
<td>Annona squamosa L.</td>
<td>snake poison remedy</td>
<td>pinha</td>
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<tr>
<td>Xylopia frutescens Aubl.</td>
<td>body aches</td>
<td>pindaiba</td>
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<tr>
<td>Apliaceae</td>
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<td></td>
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<tr>
<td>Coriandrum sativum L.</td>
<td>menstrual cramps, digestive</td>
<td>coentro</td>
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<tr>
<td>Eryngium foetidum L.</td>
<td>thrush (Candida albicans)</td>
<td>centro-maranhão</td>
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<tr>
<td>Foeniculum vulgare Mill.</td>
<td>sedative, control high blood pressure, gastric problems</td>
<td>erva-doce, funcho</td>
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<tr>
<td>Petrosemum crispum (Mill.) Fuss</td>
<td>inflammation of the uterus</td>
<td>salsinha</td>
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<tr>
<td>Apocynaceae</td>
<td></td>
<td></td>
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<tr>
<td>Geissospermum laeve (Vell.) Miers</td>
<td>gastric problems</td>
<td>doutor-embira</td>
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<tr>
<td>Thevetia peruviana (Pers.) K.Schum.</td>
<td>contusion and muscular pains</td>
<td>bálisamo</td>
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<td>Araceae</td>
<td></td>
<td></td>
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<tr>
<td>Xanthosoma sagittifolium (L.) Schott</td>
<td>depurative of blood</td>
<td>taioba</td>
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<tr>
<td>Arecaceae</td>
<td></td>
<td></td>
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<tr>
<td>Cocos nucifera L.</td>
<td>gastric and kidney problems</td>
<td>coco</td>
</tr>
<tr>
<td>Euterpe edulis Mart.</td>
<td>snake poison remedy</td>
<td>jussara-branca</td>
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<tr>
<td>Aristolochiaceae</td>
<td></td>
<td></td>
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<tr>
<td>Aristolochia cymbifera Mart. &amp; Zucc.</td>
<td>hernia remedy</td>
<td>jarrinha-da-mata</td>
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<td>Asparagaceae</td>
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<tr>
<td>Agave americana L.</td>
<td>back problems</td>
<td>pita</td>
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<tr>
<td>Sansevieria trifasciata Prain</td>
<td>body aches</td>
<td>espada-de-são-de-jorge</td>
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</table>
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<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
<th>Uses</th>
<th>Local Names</th>
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<td><strong>Asteraceae</strong></td>
<td><em>Acanthospermum australe</em> (Loefl.) Kuntze</td>
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<td><em>Acanthospermum hispidum</em> DC.</td>
<td>fever, flu, expectorant, pneumonia</td>
<td>maroto</td>
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<td><em>Achyrocline satureioides</em> (Lam.) DC.</td>
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<td>maroço</td>
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<td><em>Ageratum conyzoides</em> L.</td>
<td>inflammation of the uterus, gastric problems</td>
<td>menstraste</td>
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<td><em>Argemone mexicana</em> L.</td>
<td>expectorant, pneumonia, postpartum breathing problems</td>
<td>cardo santo</td>
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<td><em>Artemisia absinthium</em> L.</td>
<td>(uterine cleansing), problems in the female reproductive system</td>
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<td>menstrual cramps, problems in the female reproductive system</td>
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<td>alecrim do campo</td>
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<td>abortive, urinary tract problems, stomach ache</td>
<td>flor roxa, balai de velho</td>
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<td><em>Centratherum punctatum</em> Cass.</td>
<td>stomach ache</td>
<td>bem-me-quer</td>
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<td><em>Chaptalia nutans</em> (L.) Pol.</td>
<td>rheumatism</td>
<td>desinchadeira</td>
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<td><em>Chromolaena odorata</em> (L.) R.M. King &amp; H. Rob</td>
<td>swelling, anti-inflammatory</td>
<td>rabo de raposa</td>
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<td><em>Conyza bonariensis</em> (L.) Cronquist</td>
<td>skin allergies</td>
<td>camomila</td>
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<td><em>Coreopsis grandiflora</em> Hogge x Sweet</td>
<td>sedative, laxative</td>
<td>peruguai</td>
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<td><em>Cytocymura scorpioides</em> (Lam.) H.Rob.</td>
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<td>picão, carrapicho-agulha, pico de mina</td>
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<td><em>Eclipta prostrata</em> (L.) L.</td>
<td>wound healing, contusions</td>
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<td><em>Gymnanthemum amygdalinum</em> (Dellie) Sch.Bip. ex Walp.</td>
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<td><em>Helianthus annuus</em> L.</td>
<td>vermifuge</td>
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<td>alface</td>
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<td><em>Pluchea sagittalis</em> (Lam.) Cabrera</td>
<td>erysipelas</td>
<td>quitoço</td>
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<td><em>Porophyllum ruderae</em> (Jacq.) Cass.</td>
<td>eyepain, mycosis</td>
<td>escova de rato, cravinho, arrudinha</td>
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<td>serralha</td>
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<td>cravo de defunto</td>
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<td>expectorant, flu</td>
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<td><em>Crescentia cujete</em> L.</td>
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<td>cabaça</td>
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<td><em>Fridericia chica</em> (Bonpl.) L. G. Lohmann</td>
<td>cough, fever</td>
<td>pitanga de mato</td>
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<td><em>Handroanthus chrysotrichus</em> (Mart. ex DC.) Mattos</td>
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<td>ipê amarelo</td>
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<td>rheumatism, bronchitis, asthma</td>
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<td>cipó alho</td>
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<td>Cordia rufescens A.DC.</td>
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<td>Symphytum officinale L.</td>
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<td>Varronia curassavica Jacq.</td>
<td>anti-inflammatory, contusions</td>
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<td>Brassicaceae</td>
<td>Lepidium virginicum L.</td>
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<td>Bromeliaceae</td>
<td>Ananas comosus (L.) Merril</td>
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<td>Cactaceae</td>
<td>Opuntia ficus-indica (L.) Mill.</td>
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<td>Pereskia grandifolia Haw.</td>
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<td>Carica papaya L.</td>
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<td>Cleomaceae</td>
<td>Tarenaya aculeata (L.) Soares Neto &amp; Roalson</td>
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<td>Combretaceae</td>
<td>Terminalia catappa L.</td>
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<td>Commelina benghalensis L.</td>
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<td>Convolvulaceae</td>
<td>Ipomoea batatas (L.) Lam.</td>
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<td></td>
<td>Ipomoea cathartica Jacq.</td>
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<td>Operculina macrocarpa (L.) Urb.</td>
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<td>Costus scaber Ruiz &amp; Pav.</td>
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<td>Costus spiralis (Jacq.) Roscoe</td>
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<td>Crassulaceae</td>
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<td>Cucurbita pepo L.</td>
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<td>Fevillia trifolobata L.</td>
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<td>Luffa cylindrica (L.) M. Roem.</td>
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<td>Momordica charantia L.</td>
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<td>Rhynchospora speciosa (Kunth) Boeckeler</td>
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<td>Dilleniaceae</td>
<td>Davilla rugosa Poir.</td>
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<td>Dioscoreaceae</td>
<td>Dioscorea bulbifera L.</td>
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**Notes:**
- **baba-de-boi-árvore**
- **confrei**
- **erva-baleeira, maria-preta**
- **agrião**
- **abacaxi**
- **barba-de-timango**
- **ora-pro-nobis**
- **mamão**
- **xixi-de-galinha**
- **amendoeira**
- **marianinha-preta, emenda-nervos**
- **cana-de-macaco**
- **melão-de-são-caetano**
- **chuchu**
- **capim-estrela**
- **cipó-caboclo, mata-pasto**
- **inhame**
### Euphorbiaceae

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<tr>
<td>Toothache</td>
<td>Cnidoscolus pubescens Pohl</td>
<td>Cnidoscolus pubescens Pohl</td>
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<td>Diarrhea</td>
<td>Euphorbia hirta L.</td>
<td>Euphorbia hirta L.</td>
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<td>Urinary</td>
<td>Euphorbia prostrata Alton</td>
<td>Euphorbia prostrata Alton</td>
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<tr>
<td>Wound</td>
<td>Euphorbia trucai L.</td>
<td>Euphorbia trucai L.</td>
<td>wound healing, anti-inflammatory</td>
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<td>Kidney</td>
<td>Jatropha curcas L.</td>
<td>Jatropha curcas L.</td>
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<td>Jatropha gossypifolia L.</td>
<td>wound healing, injuries in the corner of the mouth</td>
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<td>Wound</td>
<td>Jatropha multifida L.</td>
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<td>Manihot esculenta Crantz</td>
<td>Manihot esculenta Crantz</td>
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<tr>
<td>New belly</td>
<td>Ricinus communis L.</td>
<td>Ricinus communis L.</td>
<td>cure new belly button</td>
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### Fabaceae

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<td>Gastric</td>
<td>Amburana cearensis (Allemão) A. C. Sm.</td>
<td>Amburana cearensis (Allemão) A. C. Sm.</td>
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<tr>
<td>Diabetes</td>
<td>Bauhinia cheilantha (Bong.) Steud.</td>
<td>Bauhinia cheilantha (Bong.) Steud.</td>
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<tr>
<td>Diabetes</td>
<td>Bauhinia variegata L.</td>
<td>Bauhinia variegata L.</td>
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<tr>
<td>Flu, Cold,</td>
<td>Cajanus cajan (L.) Huth</td>
<td>Cajanus cajan (L.) Huth</td>
<td>flu, cold, headache</td>
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<tr>
<td>Appetit</td>
<td>Canavalia ensiformis (L.) DC.</td>
<td>Canavalia ensiformis (L.) DC.</td>
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<td>Desmodium incarnum (Sw.) DC.</td>
<td>Desmodium incarnum (Sw.) DC.</td>
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<td>Hymenaea courbaril L.</td>
<td>Hymenaea courbaril L.</td>
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<td>Indigofera cf. blancheliana Benth</td>
<td>Indigofera cf. blancheliana Benth</td>
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<td>Indigofera cf. suffruticosa Mil.</td>
<td>Indigofera cf. suffruticosa Mil.</td>
<td>flu, expectorant, vermifuge</td>
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<td>Diabetes,</td>
<td>Libidibia ferrea (Mart. exTul.) L. P. Queiroz</td>
<td>Libidibia ferrea (Mart. exTul.) L. P. Queiroz</td>
<td>diabetes, sexual stimulant, wound healing</td>
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<td>Diarrhea</td>
<td>Machaerium cf. isadelphum (E.Mey.) Standl.</td>
<td>Machaerium cf. isadelphum (E.Mey.) Standl.</td>
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<td>Whooping</td>
<td>Mimosa pudica L.</td>
<td>Mimosa pudica L.</td>
<td>whooping cough, hemorrhoid</td>
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<td>Sinusitis</td>
<td>Mucuna prurients (L.) DC.</td>
<td>Mucuna prurients (L.) DC.</td>
<td>sinusitis, migraine</td>
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<td>Bronchitis,</td>
<td>Plerodone marginatus Vogel</td>
<td>Plerodone marginatus Vogel</td>
<td>bronchitis, diabetes, ulcer gastritis</td>
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<td>Fever, Flu,</td>
<td>Senna alata (L.) Roxb.</td>
<td>Senna alata (L.) Roxb.</td>
<td>fever, flu, cough, sinusitis</td>
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<td>Fever, Flu,</td>
<td>Senna occidentalis (L.) Link</td>
<td>Senna occidentalis (L.) Link</td>
<td>fever, flu, cough, sinusitis</td>
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<td>Toothache</td>
<td>Vigna unguiculata (L.) Walp.</td>
<td>Vigna unguiculata (L.) Walp.</td>
<td>toothache</td>
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<tr>
<td>Urinary</td>
<td>Zornia sericea Moric.</td>
<td>Zornia sericea Moric.</td>
<td>urinary system problems</td>
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</table>

### Hernandiaceae

| Back Problems | Sparattanthelium tupiniquinorum Mart. | Sparattanthelium tupiniquinorum Mart. | back problems                                                       |

### Lamiaceae

| Headache     | Aegiphila integrifolia (Jacq.) B.D.Jacks. | Aegiphila integrifolia (Jacq.) B.D.Jacks. | headache                                                            |
| Diabetes     | Leonotis nepetifolia (L.) R.Br.           | Leonotis nepetifolia (L.) R.Br.           | diabetes                                                            |
| Fever, Flu,  | Leonurus sibiricus L.                     | Leonurus sibiricus L.                    | fever, flu, abortive                                                |
| Expectorant, | Mentha arvensis L.                        | Mentha arvensis L.                       | expectorant, post partum uterine cleansing                         |
| Flu, Exp,    | Mentha piperita L.                        | Mentha piperita L.                       | flu, expectorant and poor digestion                                |
| Bronchitis,  | Mentha pulegium L.                        | Mentha pulegium L.                       | bronchitis, expectorant, gastric system problems                   |
| Expectorant, | Mentha spicata L.                         | Mentha spicata L.                        | expectorant, post partum uterine cleansing                         |
Ethnobotany applied to the selection of medicinal plants for agroecological crops in rural communities in the Southern End of Bahia, Brazil

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Names</th>
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<tbody>
<tr>
<td>Ocimum basilicum L.</td>
<td>magerejo, alfavaquinha-do-mato</td>
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<tr>
<td>Ocimum carnosum (Spreng.) Link &amp; Otto ex Benth.</td>
<td>flu, alfavaquinha-de-galinha</td>
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<tr>
<td>Ocimum gratissimum L.</td>
<td>flu, poor digestion, tioí, alfavaca</td>
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<tr>
<td>Plectranthus amboinicus (Lour.) Spreng.</td>
<td>anti-inflammatory, expectorant, respiratory system problems hortelã-gordo, hortelã-grosso</td>
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<tr>
<td>Plectranthus barbatus Andr.</td>
<td>liver and stomach problems, hangover boldo</td>
</tr>
<tr>
<td>Plectranthus neochilus Schltr.</td>
<td>liver problems, gastritis rinzinho, boldo-do-chile</td>
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<tr>
<td>Rosmarinus officinalis L.</td>
<td>heart problems, control high blood pressure</td>
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<td>Tetradaenia riparia (Hochst.) Codd</td>
<td>toothache</td>
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<tr>
<td>Vitex agnus-castus L.</td>
<td>sinusitis, sexual stimulant pimenta-da-costa</td>
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<tr>
<td>Lauraceae</td>
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<tr>
<td>Cinnamomum verum J. Presl</td>
<td>flu, canela</td>
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<tr>
<td>Persea americana Mill.</td>
<td>kidney problems, stomach problems abacate</td>
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<td>Lecythidaceae</td>
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<tr>
<td>Cariniana legalis (Mart.) Kuntze</td>
<td>anti-inflammatory, body aches jequitibá-rosa</td>
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<tr>
<td>Eschweilera ovata (Cambess.) Mart. ex Miers</td>
<td>diarrhea, asthma biriba</td>
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<td>Struthanthus flexicaulis (Mart.) Mart.</td>
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<td>Punica granatum L.</td>
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<td>Byrsonima crassifolia (L.) Kunth</td>
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<td>Byrsonima intermedia A. Juss.</td>
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<td>Malpigia emarginata DC.</td>
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<td>Malpigia glabra L.</td>
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<tr>
<td>Abelmoschus esculentus (L.) Moench</td>
<td>expectorant, asthma, furuncle quiabo</td>
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<td>Abutilon sp.</td>
<td>flu, expectorant maiva-lisa</td>
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<td>Gossypium hirsutum L.</td>
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<td>Theobroma cacao L.</td>
<td>hemorrhoids cacau</td>
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<td>Maranta arundinacea L.</td>
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<td>Leandra australis (Cham.) Cogn.</td>
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<td>Menispermaceae</td>
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<td>Abuta selciana Eichler</td>
<td>fever, diarrhea and intestinal gas buta</td>
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<td>Moraceae</td>
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<td>Artocarpus altulis (Parkinson) Fosberg</td>
<td>control high blood pressure and cholesterol fruta-pão</td>
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<td>Artocarpus heterophyllus Lam.</td>
<td>swelling jaca-dura</td>
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<td>Ficus carica L.</td>
<td>stomach ache and e liver pain figo</td>
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<td>Scientific Name</td>
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<td>Ficus gomelleira</td>
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<td><em>Maclura tinctoria</em> (L.) D. Don ex Steud.</td>
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<td>Morus nigra</td>
<td><em>Morus nigra</em> L.</td>
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<td>Musa paradisiaca</td>
<td><em>Musa paradisiaca</em> L.</td>
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<td><em>Virola cf. gardneri</em> (A.DC.) Warb.</td>
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<td>Corymbia citriodora</td>
<td><em>Corymbia citriodora</em> (Hook.) K.D.Hill &amp; L.A.S. Johnson</td>
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<td><em>Eucalyptus globulus</em> Labill.</td>
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<td><em>Eugenia uniflora</em> L.</td>
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<td><em>Plinia cauliflora</em> (Mart.) Kausel</td>
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<td><em>Psidium cattleianum</em> Sabine</td>
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<td>Psidium guajava</td>
<td><em>Psidium guajava</em> L.</td>
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<td><em>Syzygium cumini</em> (L.) Skells</td>
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<td>Scoparia dulcis</td>
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Ethnobotany applied to the selection of medicinal plants for agroecological crops in rural communities in the Southern End of Bahia, Brazil

<table>
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<tr>
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<th>Use</th>
<th>Notes</th>
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<td>Poaceae</td>
<td>Coix lacryma-jobi L.</td>
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<td>milagre</td>
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<td>Cymbopogon citratus (DC.) Stapf.</td>
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<td>Imperata brasiliensis Trin.</td>
<td>help in child teething period</td>
<td>sapé</td>
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<td>Zea mays L.</td>
<td>urinary system problems</td>
<td>milho</td>
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<td>Portulaca oleracea L.</td>
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<td>onze-horas</td>
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<td>Fragaria ananassa (Duchesne ex Weston) Duchesne ex Rozier</td>
<td>fever, gallstones</td>
<td>morango</td>
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<td>Rosa alba L.</td>
<td>heart problems, control high blood pressure</td>
<td>rosa-branca, rosa-menina</td>
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<td>Borreria verticillata (L.) G. Mey.</td>
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<td>tapicuruzinho</td>
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<td>Genipa americana L.</td>
<td>anemia</td>
<td>genipapo</td>
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<td>Morinda citrifolia L.</td>
<td>diabetes, cancer</td>
<td>noni</td>
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<td>Rutaceae</td>
<td>Citrus × latifolia (Yu.Tanaka) Yu.Tanaka</td>
<td>flu, fever, expectorant</td>
<td>limão-tahiti</td>
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<td>Citrus aurantifolia (Christm.) Swingle</td>
<td>flu, fever, expectorant</td>
<td>limão-mirim</td>
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<td></td>
<td>Citrus aurantium L.</td>
<td>flu, fever, headache</td>
<td>laranja, laranja-da-terra</td>
</tr>
<tr>
<td></td>
<td>Citrus limon (L.) Osbeck</td>
<td>flu, fever, expectorant</td>
<td>limão, limão-mirim</td>
</tr>
<tr>
<td></td>
<td>Citrus reticulata Blanco</td>
<td>fever and flu</td>
<td>tangerina</td>
</tr>
<tr>
<td></td>
<td>Murraya paniculata (L.) Jack</td>
<td>mycosis</td>
<td>muta</td>
</tr>
<tr>
<td></td>
<td>Ruta graveolens L.</td>
<td>postpartum uterine cleansing and menstrual cramps</td>
<td>arruda</td>
</tr>
<tr>
<td>Sapotaceae</td>
<td>Mimus opscoriacea (A. DC.) Miq.</td>
<td>diabetes</td>
<td>abricó</td>
</tr>
<tr>
<td>Simaroubaceae</td>
<td>Simarouba amara Aubl.</td>
<td>prostate problems</td>
<td>gaxeta</td>
</tr>
<tr>
<td>Siparunaceae</td>
<td>Siparuna guianensis Aubl.</td>
<td>fever, headache, rheumatism</td>
<td>negramina</td>
</tr>
<tr>
<td>Solanaceae</td>
<td>Capsicum baccatum L.</td>
<td>hemorrhoids</td>
<td>pimenta-passarinho</td>
</tr>
<tr>
<td></td>
<td>Capsicum frutescens L.</td>
<td>erysipelas</td>
<td>pimenta-malagueta</td>
</tr>
<tr>
<td></td>
<td>Nicotiana glauca Graham</td>
<td>repellent, skinalergies</td>
<td>fumo</td>
</tr>
<tr>
<td></td>
<td>Nicotiana tabacum L.</td>
<td>repellent, skinalergies</td>
<td>fumo</td>
</tr>
<tr>
<td></td>
<td>Physalis angulata L.</td>
<td>antibiotic</td>
<td>camapú, guanapú</td>
</tr>
<tr>
<td></td>
<td>Solanum asperum Rich.</td>
<td>bronchitis, flu</td>
<td>caïçara</td>
</tr>
<tr>
<td></td>
<td>Solanum lycocarpum A. St.-Hill.</td>
<td>sexual stimulant</td>
<td>monocobil</td>
</tr>
<tr>
<td></td>
<td>Solanum lycopersicum L.</td>
<td>diarrhea, erysipelas</td>
<td>tomate</td>
</tr>
<tr>
<td></td>
<td>Solanum paniculatum L.</td>
<td>anti-inflammatory, diabetes, control high blood pressure</td>
<td>jurubeba</td>
</tr>
<tr>
<td>Talinaceae</td>
<td>Talinum fruticosum (L.) Juss.</td>
<td>anemia</td>
<td>beldroega</td>
</tr>
<tr>
<td></td>
<td>Talinum paniculatum (Jacq.) Gaertn.</td>
<td>anemia</td>
<td>beldroega</td>
</tr>
</tbody>
</table>
Ethnobotany applied to the selection of medicinal plants for agroecological crops in rural communities in the Southern End of Bahia, Brazil

Neto Galvão, Villas Bôas, Machado, Silva, et al.

Typhaceae

Typha domingensis Pers. hepatitis, gastritis, kidney problems taboa

Urticaceae

Cecropia glaziovii Snethl. cough, whooping cough embaúba-roxa

Cecropia pachystachya Trécult control high blood pressure and cholesterol embaúba-branca

Pilea microphylla (L.) Liebm. control high blood pressure, uterine problems brilhantina

Verbenaceae

Aloysia gratissima (Gillies & Hook.) Tronc. flu, fever, sedative alfazema

Lantana camara L. flu, bronchitis, expectorant camarã, chumbinho

Lippia alba (Mill.) N.E.Br. ex Britton & P.Wilson sedative, gastric system problems erva-cidreira, cidreira-muída

Stachytarpheta cayennensis (Rich.) Vahl gastric system problems, hepatitis and kidney problems gervão, carqueja-do-campo

Violaceae

Pombalia calceolaria (L.) Paula-Souza vermifuge, laxative, reproductive system problems batata-de-purga

Zingiberaceae

Alpinia zerumbet (Pers.) B.L. Burtt & R.M. Sm. sedative, control high blood pressure água-de-colônia

Curcuma longa L. hepatitis, menstrual cramps açafrão

Hedychium coronarium J. Koenig labyrinthitis, control high blood pressure lírio-branco

Zingiber officinale Roscoe fever, flu, expectorant gengibre

Among the respondents 114 are women and 66 are men, with ages varying between 15 to 94 years old, distributed among the following age groups: youngsters, up to 19 years old (1); adults, from 20 to 59 (100) and elderly, above 60 years old (79). Most of them declared being from the State of Bahia (77%), while 33% came from the states of Pernambuco, Ceará, Espírito Santo and Minas Gerais. Those who live in the communities of Ribeirão and Pouso Alegre claim to have lived in these localities for over 20 years, and the others have resided in the MST settlements since the date of its creation (on average 10 years at the time the survey was carried out). The predominance of women and elderly individuals may be related to the fact that, according to Viu et al.[27], women have historical and cultural value when considering the food tradition of a region and they are responsible for the health of the family and their food safety. Melo et al.[28], however, point out that elderly individuals in general are able to recognize a greater number of plants than younger ones and, therefore, they have more chances of being appointed as local specialists to be interviewed.

The respondents are primarily dedicated to agriculture as an economic activity (95%) and the average family income reaches up to one minimum wage for 91% of their families. As for the level of education, 53% claim to have elementary education, 7% secondary education and 37% did not have access to formal education. When asked about the origin of their knowledge about medicinal plants, 91% claim to have learned it with their own families and the remaining 8% with neighboring communities, including indigenous communities. Most of the respondents (88%) declare that they are regularly approached in order to indicate plants and their uses, however, this approach is restricted to relatives and neighbors who reside in the same community. Only 26% are approached by people outside their communities in order to indicate the use of medicinal.
plants. According to Bandeira[29], ethnobiological studies involving the process of knowledge transmission and acquisition are scarce, however, it may be inferred that this local knowledge is acquired and transmitted through practices and beliefs developed by adaptive processes, which are culturally transmitted between generations[30], especially within family nuclei and among residents of a same community, as observed by Boscolo et al.[31]. The transmission of the wealth of this knowledge still finds obstacles frequently cited in ethnobotany studies, such as Boscolo et al.[31-33], in which the following are noted: the process of losing the tradition of transmitting knowledge to successor generations due to the lack of interest of children and grandchildren; the disarticulation of traditional life systems and geographical distance[33]. 

Among the 233 species of medicinal plants surveyed in the 9 communities it was found, by consulting the Flora Brasil 2020 list[20] that 48% are considered native, 26% are naturalized and 26% are exotic. As to the level of threat consulted at the CNC Flora database[22], it was observed that 94% of the species have no evaluation, while the others are distributed in: Least concern (Pfaffia glomerata (Spreng.) Pedersen; Aristolochiacymbiiera Mart. & Zucc.; Handroanthus heptaphyllus (Vell.) Mattos; Tillandsia usneoides (L.) L.; Pereskiagrandifolia Haw.; Operculina macrocarpa (L.) Urb.; Hymenaea courbaril L.; Abuta selsoana Eichler e Genipaamericana L.); Near-threatened (Handroanthus impetiginosus (Mart. ex DC.) Mattos; Amburana cearensis (Allemão) A.C.Sm.); Vulnerable (Euterpe edulis Mart.) and Endangered Cariniana legalis (Mart.) Kuntze).

The predominance of naturalized and cultivated exotic species found in the present study could be related to a trend described by Bortolotto[33], in which human populations select plants mainly for subsistence, as in rural communities. It is also worth mentioning that many species of the medicinal plant pharmacopoeia in South America were introduced in the period of the European conquests Bennett et al.[34] and are widely used until today. Another worrying factor in terms of conservation is the increasing anthropization of the southern end region of Bahia, where deforestation caused by large pulp and paper companies generates the loss of natural resources with the extensive eucalyptus culture[35]. As a consequence, plant resources for medicinal use also become increasingly scarce and the production of home medicines falls into disuse, making the search for allopathic medicines grow[36]. The presence of species at different degrees of threat observed in this study draws attention to the urgency of conducting research that values biodiversity and the traditional knowledge associated with it before these resources are lost. Thus, the importance of ethnobotany is evident for the development of sustainable exploitation of ecosystems, in contrast to the current forms of devastation[36].

Diseases related to the gastric system, respiratory and genitourinary systems (TABLE 1) were the most cited. Diseases of the gastric system can be related to the lack of basic sanitation and treated water in the communities studied[15]. The presence of a large number of citations related to the genitourinary system follows the same premise observed in Bortolotto[33], where there was also a predominance of women in the sample and they cited species with uses related to the uterus, menstrual cramps and childbirth.

In the face of economic and infrastructure infeasibility to carry out the cultivation of the 233 species resulting from the survey, it was necessary to employ quantitative methods in order to select which would be most suitable for insertion in agroecological productive systems that could be used as therapeutic resources and also as an alternative source of income in the 9 communities studied. Therefore, it was decided to favor the ones which presented and index of concordance regarding the corrected main use (CUPc) equal to or greater than 50% in at least one of the communities in which they were mentioned (TABLE 2). According to Roque et al.[37], the more respondents agree on a particular use, the greater is the probability of confirmation of this information which, in the future, may also serve as a basis for pharmacological studies.
The nine communities from the southern end of Bahia contemplated in this study live in a scenario of low income and isolation, in a region of socioenvironmental conflicts, and which until the moment of this study did not have any visibility with the local SUS. Some of these communities did not have a defined geographical population that seeks aid with medicinal plants. Therein resides the importance of ethnobotanical studies that revitalize and systematize the traditional knowledge associated with medicinal plants that may be used to improve the quality of these populations, since for Chaves et al., the healing properties of some plants are the only alternative that several communities have in order to treat diseases.

The introduction of the species (present on TABLE 2) in agroecological productive systems in the communities studied not only provides an alternative for the treatment of diseases, but it is also important for the conservation of socio-biodiversity and in the generation of income. Santilli states that agroecology is a tool for the preservation of sociobiodiversity, which in turn is an essential component of sustainable development. The species found in rural communities in the Southern End of Bahia, Brazil, highlight the importance of preserving local biodiversity through the use of traditional knowledge, as it not only supports community health but also contributes to the conservation of socio-biodiversity.

### TABLE 2: List of species with CUPc equal to or greater than 50% in at least one of the communities studied.

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>AV</th>
<th>AA</th>
<th>BM</th>
<th>HE</th>
<th>JR</th>
<th>JM</th>
<th>PA</th>
<th>RI</th>
<th>SJ</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Alpinia zerumbet</em> (Pers.) B. L. Burtt &amp; R. M. Sm.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>54%</td>
</tr>
<tr>
<td><em>Baccharis crispa</em> Spreng.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Borrelia verticillata</em> (L.) G. Mey.</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Citrus aurantium</em> L.</td>
<td>-</td>
<td>64%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Cymbopogon citratus</em> (DC.) Stapf.</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>50%</td>
<td>-</td>
<td>57%</td>
<td>-</td>
<td>-</td>
<td>71%</td>
</tr>
<tr>
<td><em>Dysphania ambrosioides</em> (L.) Mosyakin &amp; Clemants</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>53%</td>
<td>64%</td>
<td>63%</td>
<td>50%</td>
<td>50%</td>
<td>62%</td>
</tr>
<tr>
<td><em>Eugenia uniflora</em> L.</td>
<td>-</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Euphorbia prostrata</em> Aiton</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>67%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Foeniculum vulgare</em> Mill.</td>
<td>-</td>
<td>78%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>57%</td>
<td>56%</td>
<td>-</td>
<td>50%</td>
</tr>
<tr>
<td><em>Gossypium hirsutum</em> L.</td>
<td>-</td>
<td>57%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Kalanchoe crenata</em> (Andrews) Haw.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>57%</td>
<td>57%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50%</td>
</tr>
<tr>
<td><em>Lippia alba</em> (Mill.) N.E. Br. ex Britton &amp; P. Wilson</td>
<td>63%</td>
<td>50%</td>
<td>-</td>
<td>79%</td>
<td>81%</td>
<td>50%</td>
<td>50%</td>
<td>77%</td>
<td>57%</td>
</tr>
<tr>
<td><em>Mentha piperita</em> L.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>54%</td>
</tr>
<tr>
<td><em>Ocimum carnosum</em> (Spreng.) Link &amp; Otto ex Benth.</td>
<td>-</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50%</td>
</tr>
<tr>
<td><em>Ocimum gratissimum</em> L.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>57%</td>
<td>-</td>
<td>57%</td>
<td>-</td>
<td>-</td>
<td>50%</td>
</tr>
<tr>
<td><em>Operculina macrocarpa</em> (L.) Urb.</td>
<td>-</td>
<td>71%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>62%</td>
</tr>
<tr>
<td><em>Persea americana</em> Mill.</td>
<td>-</td>
<td>58%</td>
<td>-</td>
<td>79%</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>77%</td>
</tr>
<tr>
<td><em>Phyllanthus tenellus</em> Roxb.</td>
<td>-</td>
<td>80%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>85%</td>
<td>-</td>
<td>100%</td>
<td>-</td>
</tr>
<tr>
<td><em>Plantago major</em> L.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>57%</td>
<td>69%</td>
<td>-</td>
<td>50%</td>
<td>-</td>
<td>57%</td>
</tr>
<tr>
<td><em>Plectranthus amboinicus</em> (Lour.) Spreng.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50%</td>
<td>-</td>
<td>71%</td>
<td>-</td>
</tr>
<tr>
<td><em>Plectranthus barbatus</em> Andr.</td>
<td>75%</td>
<td>57%</td>
<td>73%</td>
<td>79%</td>
<td>69%</td>
<td>64%</td>
<td>79%</td>
<td>69%</td>
<td>-</td>
</tr>
<tr>
<td><em>Psidium guajava</em> L.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>57%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Punica granatum</em> L.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>79%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Sambucus nigra</em> L.</td>
<td>-</td>
<td>50%</td>
<td>-</td>
<td>57%</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Schinus terebinthifolia</em> Raddi</td>
<td>-</td>
<td>79%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>54%</td>
<td>-</td>
</tr>
</tbody>
</table>

AV (Abri Vermelho); AA (Antônio Araújo); BM (Bela Manhã); HE (Herdeiros da Terra); JR (Jaci Rocha); JM (Jose Marti); PA (Pouso Alegre); RI (Ribeirão) and SJ (São João).
agricultural systems. The diversification of crops in a particular ecosystem, associated with ecological factors, guarantee stability and less need for pesticides and nitrogen fertilizers. The use of knowledge and management practices of the medicinal plants held by the respondents constitute an asset of immense value for the marketing of these products [12], since according to Ethur et al. [41], there is a market for both the commercialization of teas and parts of medicinal plants in natura or dehydrated, as for the production of seedlings, substrates and utensils.

These products cited by Ethur et al. [41] can be sold in markets and free fairs as well as offered to municipal health departments in the southern end region of Bahia, since through the National Policy on Medicinal Plants and Herbal Plants (PNPMF), there are different political and financial actions that aim to directly stimulate Brazilian municipalities to offer medicinal plants and herbal medicines to SUS.

A result that strengthens this option for the communities studied is the fact that when comparing the selection of species with the higher CUPc with the list of medicinal plants of interest to the Unified Health System (Renisus), it can be observed that 60% are included in the latter, namely: *Alpinia zerumbet* (Pers.) B. L. Burtt & R. M. Sm.; *Baccharis crispa* Spreng.; *Dysphania ambrosioides* (L.) Mosyakin & Clemants; *Eugenia uniflora* L.; *Foeniculum vulgare* Mill.; *Mentha piperita* L.; *Ocimum gratissimum* L.; *Persea americana* Mill.; *Phyllanthus tenellus* Roxb.; *Plantago major* L.; *Plectranthus barbatus* Andr.; *Psidium guajava* L.; *Punica granatum* L. and *Schinus terebinthifolia* Raddi.

It should be noted that the methodologies in ethnobotany can also help to update and improve the official lists of medicinal plants recommended by the PNPMF. In the present study we can consider the recognition of at least one species as an example of this case – *Lippia alba* (Mill.) N.E.Br. ex Britton & P. Wilson – that along with *Dysphania ambrosioides* (L.) Mosyakin & Clemants and *Plectranthus barbatus* Andr., presented a CUPc greater than or equal to 50% simultaneously in 7 or more of the 9 communities mentioned, demonstrating its high probability of effectiveness, and however, unlike the other two, *L. alba* is not listed by Renisus.

**Conclusion**

Methodologies used in ethnobotanical research, such as the concordance regarding the corrected main use (CUPc), prove to be useful in the selection of medicinal plants with a higher probability of effectiveness among the general scope of those observed in surveys. These methodologies can indicate species to be cultivated by rural communities that live in a scenario of socioeconomic vulnerability, respecting the traditional knowledge associated with them and acting as an economic and health alternative in line with the PNPMF. Other factors to be considered are the importance of these studies in stimulating the conservation and sustainable use of sociobiodiversity, as well as in updating and increasing the list of medicinal plant species that can be used by the Unified Health System.

**Acknowledgements**

We appreciate the contribution and support of all communities involved in the study, especially the partnership with the Landless Workers Movement (MST) of Brazil.
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