Review Article

The Confrontation between Ethnopharmacology and Pharmacological Tests of Medicinal Plants Associated with Mental and Neurological Disorders

Giovanna Felipe Cavalcante e Costa, 1 Hisao Nishijo, 2 Leonardo Ferreira Caixeta, 3 and Tales Alexandre Aversi-Ferreira 2, 4

1 Federal University of Tocantins, Legal Amazonia, Brazil
2 System Emotional Science, Graduate School of Medicine and Pharmaceutical Sciences, University of Toyama, Toyama, Japan
3 Unit of Neuropsychiatry, Neuropsychology and Behavior Neurology (UNCO), Federal University of Goiás, Goiânia, Brazil
4 Laboratory of Biomathematics, Department of Anatomy, Federal University of Alfenas, Alfenas, MG, Brazil

Correspondence should be addressed to Tales Alexandre Aversi-Ferreira; aversiferreira@gmail.com

Received 14 December 2017; Revised 16 March 2018; Accepted 17 April 2018; Published 2 July 2018

Academic Editor: Letizia Angiolella

Copyright © 2018 Giovanna Felipe Cavalcante e Costa et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

For neurological disorders, pharmacological tests have shown promising results in the reduction of side effects when using plants with known therapeutic effects in the treatment of some types of dementia. Therefore, the goals of this study are to gather data about the major medicinal plants used in the nervous system as described in ethnopharmacological surveys from South America and Brazil and to compare this data with the results from pharmacological tests on the active principles of those same plants found in the scientific literature. After collecting the data about each plant, their respective popular indication was compared with the results found through pharmacological tests. The discrepancy rate between the effects observed by ethnopharmacological and pharmacological methods in this study is greater than 50%. In conclusion, despite the importance of ethnopharmacological data, it is important to make comparisons with pharmacological tests for the same plants, since the pharmacological studies, although few, have shown a high rate of discrepancy in the results.

1. Introduction

The knowledge of medicinal plants for therapeutic purposes originated from indigenous tribal cultures [1–4] or ancient civilizations such as those once found in Iran, India, or China [1–3, 5–7] and was passed from generation to generation mostly by means of oral tradition. Presently, knowledge is commonly limited to a village and rural areas or by families isolated from urban centers [8]. Most likely, original information of plants used for therapeutic purpose underwent modifications through time. This was due to their discovery by trial and error over many generations and the oral transmission of information rather than through writing.

A previous study associated culturally propagated therapeutic effects of different medicinal plants obtained by ethnopharmacological/ethnobotanical means with those found in laboratory tests, showing approximately 66% discrepancy in the results [9]. Trading and distribution mistakes [10], similarity of plant names for different species [11], presence of impurities during preparation from other plants, insects, and mushrooms [12], and unexpected reactions and interactions with the active compounds [13] are all examples of commonly encountered problems in the therapeutic use of medicinal plants.

It is not suggested that the medicinal use of plants should be banned, decreased, or hampered. However, there is a need for each procedure to be evaluated by government agencies, institutions, and specialists who understand the therapeutic use of biodiversity in societies with an increasing interest in alternative treatments [6, 14, 15] or in populations with limited or no access to other types of therapeutic resources. Medicinal plant-based therapy may offer benefits,
like decreased side effects [16–18], higher autonomy for individuals in caring for their own health [3], reduced or nonexistent costs, and easy access for social groups located in inaccessible areas or away from urban centers and for people in poor urban areas with limited or no access to a healthcare system [6, 14, 15, 19, 20]. Indeed, those groups rely on alternative therapeutic methods for their health care, especially those derived from local medicinal plants, which is a major issue in countries with higher income gaps.

Many ethnopharmacological surveys were performed in countries and regions representing the greatest biodiversity to identify plants used, with the aim of preserving the cultural heritage of the plant therapy [1–3, 5–7, 21, 22] and acquiring new active compounds for the pharmaceutical industry [8]. Brazil presents the largest biodiversity on the planet [23] and has a large amount of unexplored resources available for ethnopharmacological and herbal studies given that only 16% of Brazil’s medicinal plants or just 8% of Brazilian national flora [24] has been evaluated for therapeutic potential [25]. This country represents around 47% of all territories of the South American continent.

Countries in South America present important data about medicinal plants, because of their specific locations in the Andean region, close/into the Amazon Forest [8] or the pampas. Indeed, the use of some medicinal plants was first found in the population in the Andes Ridge, in the pampas, Patagonia [10], or Brazil’s savanna (cerrado) [9]. Probably because of the large population or size, most of the studies in South America are found in Brazil, while ethnopharmacological studies are incipient in other countries in this continent [8, 10].

However, quality or reliability of medicinal plant effects cannot be ensured if ethnobotanical studies do not provide laboratory verification of the effects when prescribing compounds derived from those medicinal plants. Healthcare professionals and patients should note that studies about the correspondence or discrepancy between ethnopharmacological knowledge and laboratory tests for the same plant are lacking [9] and must be done for each class of drug.

There is a growing evidence from in vitro, animal, and clinical studies reporting that medicinal plants might be beneficial for treating various mental and neurological disorders including Alzheimer disease, depression, anxiety, and insomnia [363–366]. For neurological disorders, in particular, pharmacological tests have shown promising results in the reduction of side effects when using plants with known therapeutic effects in the treatment of some types of dementia [18, 22, 367–372]. Medicinal plants have been sought as an alternative therapy [18, 373–375] owing to the inefficacy of some industrial medications on certain diseases, such as degenerative ones. Examples are the use of *Melissa officinalis*, *Salvia officinalis*, *Ginkgo biloba*, and *Huperzia serrata* for treating the symptoms of Alzheimer disease [18, 373–375].

The problem is that, especially in developing and/or populated countries, people rely on medicinal plants as primary healthcare [376]. The situation is true for mental and neurological disorders. Patient complaints associated directly or indirectly with neurological or neuropsychiatric disorders, such as headache, insomnia, amnesia, anxiety, or depression, are very common [146, 298, 377, 378], and the use of medicinal plants for these purposes is very frequent in populated countries such as Brazil, India, and China [1–3, 5–7, 22] but without support of adequate pharmacological tests.

Considering the errors in the use and sale of alternative medicines as a whole, we hypothesize that the same errors could happen with plants that act directly on the nervous system. Therefore, the goal of this study is to gather data about the major medicinal plants used in the neural system, as described in ethnopharmacological surveys from South America like in Brazil and compare this data with the results from pharmacological tests on the active principles of those same plants found in the scientific literature. Specifically, this study intends to present reliable data for the use of medicinal plants in primary healthcare and assisting conventional treatments of neurological disorders.

2. Materials and Methods

This study was done through literature review of ethnopharmacological surveys on the medicinal plants used by groups in South America (with emphasis on Brazil) found in academic databases (MEDLINE, LILACS, Scopus, SciELO, Google Academic, and Elsevier). The terms searched were ethnobotanical studies, medicinal plants, ethnopharmacology, neural system, South America, and Brazil. The search was restricted to the most recent and classical articles/books written in Portuguese, English, or Spanish. After collecting the data about each plant, their respective popular indication was compared with the results found through pharmacological tests.

For the first phase, 55 ethnobotanical survey articles were selected and then the most commonly used plants by the population for treating neural system disorders were identified. A table was prepared with data regarding family, scientific name, part of the plant utilized, preparation method, indications, and comparison with pharmacological tests.

In the second phase, 181 articles in which pharmacological tests had been performed with the chosen plants were selected. Unfortunately, scientific tests for the proposed indication or toxicity for all the plants could not be found.

Statistical analysis was done using central tendency measures such as modal frequency.

3. Results

Data on South American medicinal plants that act on the nervous system was summarized by family, scientific name, part of the plant utilized, preparation method, indications, and comparison with pharmacological tests (Table 1). The most cited families were Lamiaceae (24/138), Asteraceae (16/138), and Verbenaceae (6/138), representing 33.7% of the medicinal plants analyzed (Figure 1).

The most common indications, according to ethnopharmacological surveys, were calmpative/sedative (72/167), analgesic (39/167), and headache (35/167), representing 86.2% of all indications (Figure 2).

Ethnobotanical surveys revealed that the leaves (70/160) and the whole plant (13/160) amounted to 51.7% of all plant...
| Family       | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population | Pharmacological tests                                                                 | Divergences |
|-------------|-----------------------------|--------------------------------|--------------------------------------|--------------------------------------------------------------------------------------|-------------|
| Acanthaceae | Hygrophila tyytha Leonard/Tame-male | Infusion/Part air plant       | Calmative [26]                       | Anxiolytic effect, anticonvulsant and sedative [26]                                  | No          |
|             | Justicia pectoralis Jacq./Anador | Decoction/Leaf               | Headache [27]                        | Anxiolytic and depressor Neural Central System [28], analgesic and anti-inflammatory [29], estrogenic, progestagenic and anti-inflammatory effects [30], antioxidant [31] | No          |
| Alismataceae| Echinodorus grandiflorus (Cham. & Schltdl.) Mich./Hat leatherback | Decoction/Leaf               | Analgesic [21]                       | Anti-inflammatory and analgesic [32, 33], diuretic [33], antihypertensive [34, 35]    | No          |
| Amaranthaceae| Alternanthera paronychioides St-Hil./Anador | Not found/Leaf, stalk       | Analgesic [36]                        | Antioxidant [37]                                                                    | Yes         |
| Apiaceae    | Apium graveolens L./Celery | Not found/Complete plant     | Calmative [36]                        | Vasorelaxant and antihypertensive [38]                                               | Yes         |
|             | Coriandrum sativum L./Coriander | Infusion/Seed               | Headache [39]                        | Antioxidant [40], anti-inflammatory [41], antibacterial [42], anxiolytic, sedative and muscle relaxant [43], antifungal [44], hypoglycemic, hypolipidemic and hepatoprotective [45], analgesic [46] | No          |
|             | Pimpinella anisum L./Fennel | Infusion/Seed               | Calmative [7, 27, 39, 47–49]        | Antibacterial [50], neuroprotective and anticonvulsant [51], antiviral and immunostimulating [52], antioxidant [53], anticancer [54] | No          |
|             | Foeniculum vulgare Mill./Fennel | Decoction/Stalk             | Headache and calmative [13, 36, 55–60] | Antimicrobial [61], diuretic [62], antihelminthic [63], antioxidant [64], anxiolytic [65] | No          |
| Aquifoliaceae| Ilex paraguariensis/Erva Mate | Infusion/leaves, branches   | Stimulant [66]                       | Stimulant [66]                                                                       | No          |
| Araliaceae  | Didymopanax macrocarpum (C. & S.) Seem./Five leaves | Compress, bathe/Leaf        | Analgesic [67]                       | Not found                                                                            | Not found   |
|             | Hedera helix/Hiedra | Cataplasm/Leaf               | Analgesic, neuritis, neuralgia [68]  | Expectorant and antitussive [69], mucolytic and bronchodilator [70], anti-inflammatory [71] | No          |
| Aristolochiaceae| Aristolochia esperanzae O. Kuntze/Papo de peru, cipo-millhomem | Decoction/Complete plant | Analgesic [67]                       | Antiphidic activity [72], antimicrobial [73]                                          | Yes         |
|             | Aristolochia gilbertii Hook/Millhomem | Infusion/Root               | Headache [7]                         | Not found                                                                            | Not found   |
| Family          | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population | Pharmacological tests | Divergences |
|-----------------|-----------------------------|--------------------------------|---------------------------------------|-----------------------|-------------|
| Aristolochia melastoma Manso ex. Duchtra/Capitáozinho | Decoction/Root, leaf | Sedative [67] | Not found | Not found | |
| Asteraceae      |                            |                                |                                       |                       |             |
| Achillea millefolium L./Ponta-alvio | Decoction/Complete plant | Calmative, analgesic [21, 36, 47, 57, 74, 75] | Immunostimulating [76] | Yes | |
| Achyrocline satureioides D.C./Macela | Infusion/Flower | Sedative, calmative, headache [56, 67, 75, 77, 78] | Anticancer [79], calmitive effect, anti-inflammatory and antispasmodic [80], antiviral [81] | No | |
| Artemisia absinthium L./Losna | Decoction/Leaf | Analgesic [21, 82] | Anticancer [83], antifungal [84], antibacterial [85], antileishmanial [86] | Yes | |
| Artemisia camphorata Vill./Camphor | Infusion/Leaves | Calmative [58] antiepileptic [87] | Not found | Not found | |
| Artemisia vulgaris L./Artemisia | Not found | Headache [88] | Antibacterial [89] | Yes | |
| Chamomilla recutita (L.) Rauschert/Camomile | Infusion/Flower | Calmative, sedative [36, 39, 48, 57, 90–92] | Anticancer and anti-inflammatory [92, 93], gastroprotection [94], antihyperglycemic and antioxidant [95] | Yes | |
| Chrysanthemum parthenium Bernhaidi/Artemisia | Decoction, infusion/Leaves | Calmative [78] | Not found | Not found | |
| Cynara scolymus L./Artichoke | Not found | Calmative [74] | Diuretic [96], prolonged satiety sensation and hypoglycemic [97], antioxidant [98] | Yes | |
| Lactuca sativa L./Lettuce | In nature, infusion/Leaves, root | Calmative, sedative [74, 99] | Antioxidant [100] | Yes | |
| Matricaria chamomilla L./Camomile | Infusion/Leaves | Calmative [56, 75, 78, 101, 102] | Antibacterial and antioxidant [103] | Yes | |
| Mikania hirsutissima DC./Cipó-cabelado | Not found | Calmative [67, 104] | Antiophidic activity and anti diarrheal [105] | Yes | |
| Solidago chilensis Meyen/Arnica | Compress/Complete plant | Analgesic [106] | Anti-inflammatory [107] | Yes | |
| Spilanthes oleracea/Anestesiol | Not found | Anesthetic [108] | Peptic antiulcer and contraception [109] | Yes | |
| Tanacetum sp./Macelinha | Decoction/Complete plant | Analgesic [23] | Not found | Not found | |
| Tanacetum vulgare L./Catinga-de-mulata | Decoction, maceration/Leaves | Analgesic [23] | Antibacterial and antifungal [110], antiviral [111], cytotoxic [112], treatment of infections caused by Trypanosoma cruzi and Leishmania amazonensis [113], immunomodulatory [114], antihelminthic [115] | Yes | |
| Vernonia cf. condensata Baker./Boldo do chile | Infusion/Bark | Calmative [57] | Antitumor and anti-inflammatory [116], antioxidant [117] | Yes | |
| Bignoniaceae     |                            |                                |                                       |                       |             |
| Anemopaegma arvense/Catuaba | Infusion, decoction/Root, bark, leaves | Nervous exhaustion [118] | Increased weight and testicular parenchyma [119], antifungal [120] | Yes | |
| Bombacaceae      |                            |                                |                                       |                       |             |
| Eriothea candolleana (K. Schum.)/Catuaba | Infusion/Root | Nervous exhaustion [121] | Not found | Not found | |
| Boraginaceae     |                            |                                |                                       |                       |             |
| Cordia verbenacea DC./Maria preta | Bathe/Leaves | Analgesic [49] | Antimicrobial [122], anti-inflammatory [123] | No | |
| Family            | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population | Pharmacological tests | Divergences |
|-------------------|-----------------------------|--------------------------------|--------------------------------------|-----------------------|-------------|
| Brassicaceae      | *Coronopus didymus (L.)* Smith/Mastruz | Maceration/Leaves | Analgesic [49] | Healing [124], anti-inflammatory [125] | No |
| Bromeliaceae      | *Tillandsia usneoides (L.)* 1/Barbra de velho | Not found | Antiepileptic [49] | Abortion [126], antiviral [127] | Yes |
| Buddlejaceae      | *Buddleja brasilensis* Jacq./Verbasco | Infusion, cataplasm/Part air plant | Calmative [67] | Low potential hemolytic [128] | Yes |
| Burseraceae       | *Commiphora myrrha* (T. Nees) Engl/Myrrh | Infusion/Leaves | Calmative [49] | Antioxidant [117], analgesic [129] | Yes |
| Caesalpiniaceae   | *Bauhinia forficata* Link./Pata de vaca | Decoction/Leaves | Analgesic [23] | Antioxidant and increased liver glycogen [130], antimutagenic [131] | Yes |
| Canellaceae       | *Capsicodon dinissi* Occhioni/Pepper | Not found | Migraine [104] | Not found | Not found |
| Caprifoliaceae    | *Cleome spinosa* Jacq./Mussambé | Infusion/Complete plant | Headache [132] | Cytotoxic [49], antioxidant [133], anti-inflammatory and antinociceptive [134] | No |
| Capparaceae       | *Sambucus nigra* L./Elderberry | Decoction/Leaves | Analgesic [23, 49] | Anti-inflammatory and antioxidant [134], parasiticidal [135] | No |
| Chenopodiaceae    | *Chenopodium ambrosioides* L./Yerba Santa Maria | Maceration, infusion/Leaves, bark, seed | Analgesic, calmative [23, 48, 57] | Antitumor [79], hypotensive [136], antipyretic and anxiolytic [137] | Yes |
| Compositaceae     | *Baccharis trimera* (Less) D.C./Gorse | Infusion/Leaves | Headache [138] | Antiulcer and antioxidant [139], anti-inflammatory [140], anti-inflammatory and analgesic [141] | No |
| | *Vernonia condensata* B./Boldo | Infusion, decoction/Leaves | Calmative [138] | Antioxidant [117], analgesic [142] | Yes |
| Cucurbitaceae     | *Cayaponia tayuya* (Vell.) Cogn./Táitúa | Infusion, decoction/Root | Neuralgia [67] | Hepatotoxic [142], anti-inflammatory [143] | Yes |
| Dilleniaceae      | *Davilla rugosa* Poir./Vine cabloco | Bathe/Root | Sedative [67] | Antioxidant [144], antiulcer [145] | Yes |
| Euphorbiaceae     | *Jatropha curcas* L./Pão-bravo | Infusion/Seed | Headache [102, 132] | Acetylcholinesterase inhibitor [146], antibacterial, antioxidant and antitumor [147, 148], cytotoxic [149] | Yes |
| | *Ricinus communis* L./Castor beans | Infusion/Leaves | Headache [77, 87] | Antimicrobial and anticancer [150], antimicrobial [151] | Yes |
| Family       | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population | Pharmacological tests | Divergences |
|-------------|----------------------------|--------------------------------|--------------------------------------|-----------------------|-------------|
| Fabaceae    |                            |                                 |                                      |                       |             |
| Caesalpinia ferrea Mart. ex. Tul./Pau ferro | Not found | Analgesic [57] | Nutritional supplementation of iron, zinc and manganese [152], anti-inflammatory and healing [153], antihyperglycemic [154], antimicrobial [155] | No |
| Cajanus flavus De Candolle/Andu beans | Infusion/Leaves | Headache [99] | Not found | No |
| Erythrina falcata Benth./Surina, mulungu | Not found | Sedative and antiepileptic [67, 104] | Depressant CNS [156] | No |
| Indigofera anil/Anil | Decoction, infusion/Complete plant | Sedative [67] | Anti-inflammatory [157], lectin activity [158], antiepileptic [159], antiparasitic [160] | Yes |
| Pterodon emarginatus/Sucupira | Infusion/leaves, fruit | Headache [120] | Antimicrobial [161–163], analgesic and anti-inflammatory [164]; antileishmanial, anticancer, hypoglycemic [165] | No |
| Ginkgoaceae | Ginkgobiloba/Ginco | Decoction, infusion/Leaves | Vasodilator, brain dysfunction, dizziness and concentration and memory [160] | Treatment of Alzheimer disease [166], prevention of dementia [167], antioxidant, vasodilator, stimulant of SNC [168] | No |
| Geraniaceae | Pelargonium graveolens L’Her/ Mauve smelling | Not found | Sedative [87] | Anxiolytic and antidepressant [159], antibacterial [169], hypoglycemic and antioxidant [170] | No |
| Mimosa pudica L./Dormideira | Infusion/Complete plant | Sedative [99] | Reduction of fertility [171], hepatotoxic [172], lipid-lowering [173], anxiolytic and antipyretic [137], antiophidic [174] | No |
| Iridaceae | Calydraea sp./Jabotitana | Decoction/Rhizome | Analgesic [23] | Not found | Not found |
| Labiatae | Agastache mexicana Kunth/Toronjil | Not found | Sedative [102] | Antihypertensive [175], vasorelaxant [176], anti-inflammatory and antinociceptive [177], antinociceptive [178], anxiolytic [179] | No |
| Lavandula latifolia/Lavanda | Oil | Stimulant [68] | Anxiolytic [180], antifungal [181], antioxidant [182] | Yes |
| Origanum vulgare/oregano | Infusion/Leaf | Sedative [68] | Antimicrobial [183] proapoptotic effect and cytotoxic [184], antiurolithic [185] | Yes |
| Lamieae | Coleus barbatus Benth./Falso-boldeo | Tisane mate/Leaf | Headache, calmative [56] | Hepatoprotective [186] | Yes |
| Cunila microcephala Benth./Hortelá-miúdo, hortelá-pimenta, poejo | Decoction/Complete plant | Analgesic [23, 58] | Anti-inflammatory and antioxidant [187] | No |
| Hyptis suaveolens Poit./Samba-coité | Tea/Leaf | Headache [188] | Hypoglycemic and antioxidant [189], hepatoprotective and antioxidant [190], gastroprotective activity [191], neuroprotective and antioxidant [192], antifungal [193] | Yes |
| Lavandula officinalis Chaix & Kitt/Alfazema | Tea/Leaf, stalk | Calmative [49] | Antimicrobial [194], antioxidant [195], sedative and hypnotic [196] | No |
| Family | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population | Pharmacological tests | Divergences |
|--------|-----------------------------|---------------------------------|--------------------------------------|----------------------|-------------|
| **Leonotis nepetifolia** (L.) R. Br./Cordão de São Francisco | Infusion, decoction/Leaf, branches | Sedative, headache [132, 138] | Anti-inflammatory [197], anti-inflammatory [198] | Yes |
| **Melissa officinalis** L./Erva-cidreira, melissa | Decoction/Leaf | Calmative, migraine, sedative [23, 36, 55, 58, 59, 87, 89, 90, 101, 102, 138, 199] | Anti-inflammatory [200], calmative [201], antioxidant [202], genotoxic and antimutagenic [203], neuroprotectors [199, 204] | No |
| **Mentha arvensis** L./Hortelã-mentol | Tea/Leaf | Headache [188] | Antibacterial [205], antifungal [206], anti-inflammatory and sedative [207], peptic antulcer [208] | Yes |
| **Mentha
cf. suaveolens** Ehrh./Hortelã, hortelã-grande | Decoction, maceration/Leaf | Calmative, Analgesic [23, 199] | Antifungal [209, 210], antioxidant [211], antibacterial [212] | Yes |
| **Mentha piperita** L./Hortelã, hortelã-roxo | Decoction/Complete plant | Analgesic [23, 102] | Antifungal [213, 214], antioxidant [211], anthelmintic [215], hypoglycemic and hypolipidemic [216], anticancer [217], analgesic [218] | No |
| **Mentha pulegium** L./Poejo | Decoction/Stalk | Calmative, sedative [47, 56, 58, 78] | Antioxidant [211], antimicrobial [219] | Yes |
| **Mentha sp./Hortelã** | Decoction/Stalk | Headache, Calmative [36, 47, 49, 55–57] | Anthelmintic [215] | Yes |
| **Mentha spicata** L./∗∗∗ | Headache [87] | Antiglycemic and hypolipidemic [216], antioxidant [220], antiemetic [221] | Yes |
| **Mentha × villosa** Huds./Hortelã | Tea/Leaf | Headache [188] | Antifungal and antibacterial [222], antimicrobial and antioxidant [223], analgesic and antispasmonic [153] | No |
| **Ocimum basilicum** L./Alfavaca | Decoction, maceration/Leaf | Calmative, analgesic [23, 39] | Antidepressant and anticonvulsant [224] | Yes |
| **Ocimum gratissimum** L./Louro | Tea/Leaf | Headache, calmative [49, 87, 188] | Anticonvulsant [225, 226], antifungal [227] | Yes |
| **Ocimum minimum** L./Manjeriçao | Maceration/Leaf | Headache [94] | Antiulcerogenic and antioxidant [35] | Yes |
| **Ocimum selati** Benth./Alfavaca | Infusion, tea/Leaf | Calmative [138] | Antibacterial [219], analgesic and antiarthritis [220] | Yes |
| **Origanum majorana** L./Manjerona | Decoction/Stalk | Calmative [56] | Antibacterial [228], antioxidant [49], antitumor and tumoricidal [229], antihyperglycemic and antihyperlipidemic [230] | Yes |
| **Plectranthus barbatus** Andr./Boldo | Decoction, maceration/Leaf | Analgesic [23, 57, 60] | Cytotoxic [231], acetylcholinesterase inhibitor [232], antimicrobial [233] | Yes |
| **Plectranthus neochilus** Schlechter/Boldo do Chile | Infusion/Leaf | Headache [89] | Analgesic [234] | No |
| **Rosmarinus officinalis** L./Alecrim | Decoction/Leaf | Analgesic, calmative [23, 39, 48, 58, 59, 102, 138, 235] | Antibacterial [236], antioxidant [237], antifungal [238], anticancer [239], antidepressant [240], analgesic [241], antioxidant, anti-inflammatory, metal chelation [242], prevention and treatment of dementia [243], neuroprotective [244] | No |
| **Salvia lachnostachys** Benth./Melissa | Decoction/Leaf | Somniferous [23, 78] | Anti-inflammatory and analgesic [244] | Yes |
| **Salvia lavandulifolia** Vahl./Mariselva | Oil/∗∗ | Nervous disorders [245] | Hypoglycemic [245], neuroprotective [246] | No |
| **Salvia officinalis** L./Salvia, barcelona | Decoction/Leaf | Calmative, Analgesic [23] | Antibacterial [228], anti-inflammatory [247], antidiarrheal and antispasmodic [185], analgesic and anti-inflammatory [248] | No |
| Family       | Scientific name/common name          | Forms of preparation/used part | Medicinal effects cited by population                                      | Pharmacological tests                                                                 | Divergences |
|--------------|--------------------------------------|--------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------|
| Lauraceae    | *                                      |                                |                                                                           |                                                                                       |             |
| Cinnamomum  | Cinnamomum zeylanicum Breyn./Canela    | Infusion, maceration/Stalk     | Calmative [39]                                                            | Antifungal [249], antimicrobial [250], antioxidant [251], antidiabetic [252]           | Yes         |
| Nectandra    | Nectandra megapotamica (Spreng.) Mez/Canela-preta | Infusion/leaf                     | Calmative [253]                                                          | Anesthetic [254]                                                                      | Yes         |
| Nectandra    | Nectandra megalopodia (Spreng.) Mez/Canela-preta | Infusion/leaf                     | Calmative [253]                                                          | Anesthetic [254]                                                                      | Yes         |
| Leguminosae  | *                                      |                                |                                                                           |                                                                                       |             |
| Acosmium     | Acosmium subelegans (Mohlenbr)         | Infusion, maceration/Stalk     | Calmative [253]                                                            | Anesthetic [254]                                                                      | Yes         |
| Hymenaea     | Hymenaea courbaril L./Jatobá           | Infusion, maceration/Bark, fruit | Sedative [132]                                                            | Not found.                                                                             | No          |
| Tamarindus   | Tamarindus indica/Tamarindo            | Compress, bath, infusion/Stalk, leaves, fruit | Treatment of fever, stomach upset, diarrhea, jaundice and as skin cleaners [256], inflammation, urinary tract infection and laxative [257], headache and stress [258] | Antibacterial [256], antihelminthic [257], antioxidant [259], antinociceptive [260], analgesic and anti-inflammatory [261], antihistaminic and antianaphylactic [262], antiulcer [263] | No          |
| Liliaceae    | *                                      |                                |                                                                           |                                                                                       |             |
| Allium sativum | Allium sativum L./Alho                | Infusion, maceration/Stalk, fruit | Headache [59]                                                             | Hypotensive [264], synergy with antibiotics [265], antioxidant [266]                   | Yes         |
| Malpighiaceae| *                                      |                                |                                                                           |                                                                                       |             |
| Banisteriopsis | Banisteriopsis caapi/Mariri, ayahuasca | Decoction, infusion/vine         | Hallucinogen, emotional and cognitive sensory changes, psychoactive [267–269] aid in treatment of abuse of other Psychoactives [270] | Hallucinogen [271] inhibiting the reuptake of serotonin, in addition to inhibiting MAO [272] | No          |
| Galphimia    | Galphimia glauca/Amarilla              | Maceration/Part air plants       | Calmative [273]                                                            | Anxiolytic [273]                                                                      | No          |
| Meliaceae    | Cedrela fissilis/Cedro-rosa            | Infusion/Bark                    | Headache [121]                                                            | Not found.                                                                             |             |
| Cannabissativa | Cannabissativa (maconha, marijuana, cânhamo) | Oil, inhalation/Leaves, stalk, flowers | Treatment of pain, nausea and vomiting, multiple sclerosis and other neurological disorders, loss of appetite and eating disorders, Insomnia, anxiety and depression, neuroprotective action [274], antiemetic, appetite stimulant [275], clinical and experimental studies in the treatment of dementias [276], schizophrenia, antipsychotic, anxiety [277], antipsychotic [278] | Treatment of pain, nausea and vomiting, multiple sclerosis and other neurological disorders, loss of appetite and eating disorders, Insomnia, anxiety and depression, neuroprotective action [273], antiemetic, appetite stimulant [274], clinical and experimental studies in the treatment of dementias [275], schizophrenia, antipsychotic, anxiety [276], antipsychotic [277], psychoactive [278] | No          |
| Dorstenia    | Dorstenia brasiliensis Lam./Carapiá    | Cataplasm/Rhizome               | Anesthetic [67]                                                            | Anti-inflammatory [278]                                                                | Yes         |
| Myrtaceae    | *                                      |                                |                                                                           |                                                                                       |             |
| Eucalyptus   | Eucalyptus globulus Labill./Eucalipto   | Infusion, Bath/Leaf             | Headache [48]                                                             | Toxic effect [279], antibacterial [280, 281]                                           | Yes         |
| Eugenia uniflora | Eugenia uniflora L./Pitangueira        | Decoction/Leaf                   | Calmative [23, 282]                                                       | Antimicrobial and antioxidant [283], anti-Trypanosoma cruzi [206]                     | Yes         |
| Family            | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population | Pharmacological tests | Divergences |
|-------------------|-----------------------------|--------------------------------|--------------------------------------|-----------------------|-------------|
| Orchidaceae       | *                            |                               | Calmative [67]                       | Not found             | Not found   |
| *Averrhoa Carambola* | L./Carambola                 | Infusion/Leaf                  | Analgesic [99]                       | Analgesic [284]       | No          |
| *Papaver somniferum* | Planta do ópio               | * * *                          | Analgesic and sedative [68]         | Not found             | Not found   |
| *Passifloraceae*   | *                            |                               | Calmative and antidepressant [67]   | Not found             | No          |
| *Pedaliaceae*      | *                            |                               | Anticonvulsant [99]                  | Hypoglycemic [289]    | Yes         |
| *Phytolaccaceae*   | *                            | Decoction/Complete plant       | Analgesic [23, 74, 99, 290]          | Antimicrobial [291], antinociceptive, sedative, anticonvulsant and depressant [292] | Yes         |
| *Piperaceae*       | *                            | Infusion/Leaf                  | Headache [121]                       | Antioxidant [293], antitumor [294], antihelminthic [295] | Yes         |
| *Poaceae*          | *                            | Decoction/Leaf                 | Calmative, analgesic and sedative    | Anxiolytic, sedative and anticonvulsant [297] | No          |
| *Polygalaceae*     | *                            | Decoction/Complete plant       | Analgesic [23]                       | Analgesic and antidermatogenic [298], antinociceptive and gastric cytoprotective activity [299] | No          |
| *Polygonaceae*     | *                            | Decoction/Stalk                | Analgesic [23]                       | Antibacterial [300], analgesic, anti-inflammatory [301] | No          |
| *Rosaceae*         | *                            | Decoction/Leaf, flower         | Analgesic [23]                       | Anti-inflammatory and antiarthritic [302], antioxidant [303], antilucer and cytoprotective [304] | No          |
| *Rubiaceae*        | *                            | Tea/Leaf, flower               | Calmative [102]                      | Inhibitory action of acetylcholinesterase [305] | Yes         |
| *Coffea arabica*   | L./Café                      | Cataplasm/Leaf                 | Headache [101]                       | Antioxidant [306], antioxidant and stimulant [307] | Yes         |
| Family | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population | Pharmacological tests | Divergences |
|--------|-----------------------------|-------------------------------|--------------------------------------|----------------------|-------------|
| **Cinchona officinalis** L./∗ | Decoction/Bark | Analgesic [23] | Not found | Not found |
| **Psychotria viridis/chacrona, ayahuasca** | Infusion/Leaves | Hallucinogen, emotional and cognitive sensory changes, psychoactive [267–269] aid in treatment of abuse of other Psychoactives [268] | Hallucinogen [308] | |
| **Alibertia sp./Marmelo** | Decoction, infusion/Root, fruit | Calmative [118] | Not found | Not found |
| **Rutaceae (5)** | | | | |
| **Casimiroa edulis** Llave & Lex./Zapote blanco | * * * | Sedative [102] | Vasodilator [309, 310], anticoagulants and antimicrobial [310], anxiolytic [311], anxiolytic and antidepressant [312] | No |
| **Citrus aurantium** L./Laranja | Decoction/Bark | Headache and calming [36, 48, 56, 59, 78, 90, 194] Low toxicity [313], anxiolytic [314, 315] | Yes |
| **Citrus limon** (L.) Burm. f./Limão-galego, | * * * | Calmative and sedative [90, 194] Neuroprotective activity and anticonvulsant [316] | Yes |
| **Citrus sinensis** (L.) Osbeck | Infusion/Leaf | Calmative, analgesic and sedative [23, 27, 49, 74, 99, 138] Antioxidant, antithyroid and antihyperglycemic [317] | Yes |
| **Ruta graveolens** L./Arruda | Decoction, maceration/Leaf | Calmative and headache [23, 39, 48, 57, 60, 102] Antimicrobial [318], antioxidant [319], antitumor [320], antinoiceptive, anti-inflammatory and antipyretic [321] | Yes |
| **Solanaceae** | | | | |
| **Atropa belladonna** L./Beladona | Decoction/Leaf | Calmative [23] Healing [322] | Yes |
| **Cestrum sendtnerianum** Mart./Guiné-do-campo | Infusion, Decoction/Leaf | Sedative [67] | Not found | Not found |
| **Solanum americanum** Mill./Maria-pretinha | Decoction/Leaf, Stalk | Sedative, Analgesic [45, 67] Antifungal [323], antioxidant and anticancer [324] | Yes |
| **Solanum cernuum** Vell/Pata de mono | * * * | Calmative [87] Antiulcerogenic [325] | Yes |
| **Umbelliferae** | | | | |
| **Anethum graveolens/Eneldo** | * * * | Sedative [68] Antifungal [326], anticonvulsant [327], anti *Helicabator pylori* [328], decreased fertility rate [329], participates in the regulation of Diabetes Mellitus [330] | Yes |
| **Coriandrum sativum/Cilantro** | Infusion/Leaf, fruit | Stimulant [68] Antioxidant [40], sedative and muscle relaxant [43], antibacterial [331], antiarthritic [332], anti-inflammatory [41], antifungal [333], hypoglycemic and hypolipidemic [334] | Yes |
| **Petroselinum hortense/Salsa da horta** | * * * | Sedative [107] Diuretic and hypotensive [335] | Yes |
| **Urticaceae** | | | | |
| **Urera baccifera** (L.)/Urtiga | Leaf | Analgesic [36] Antioxidant [336], anti-inflammatory [337] | No |
| **Verbeneaceae (6)** | | | | |
| **Aloysia citrodora** Palau/Erva luiza | * * * | Calmative [74, 286] Not found | Not found |
### Table 1: Continued.

| Family                  | Scientific name/common name | Forms of preparation/used part | Medicinal effects cited by population                                                                 | Pharmacological tests                                                                 | Divergences |
|-------------------------|-----------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------|
| Lamiaceae               | Aloysia triphylla Royle/Cidrão | Leaf                           | Sedative [55, 235]                                                                                   | Treatment of intestinal disorders [338], anti Trypanosoma Cruzi [339], anti-Helicobacter pylori [328], antibacterial [340], spasmyloytic and anti-inflammatory [341], antinoceiceptive [244] | Yes         |
| Verbenaceae             | Verbena cf. minutifolia Phil./* | Decoction/Complete plant       | Analgesic [23]                                                                                      | Not found                                                                             | Not found   |
| Zingiberaceae           | Alpinia zerumbet (Pers.) Burtt & Smith/Colônia | Leaf                           | Calmative [39, 48, 49, 101]                                                                       | Hypotensive [356], vasodilator [357], antioxidant [358]                               | Yes         |
| Zingiber officinale Rosc./Gengibre | Decoction/root             | Analgesic and headache [23, 57, 78] | Antioxidant [359], antihyperglycemic [360], antibacterial [361], androgenic [362]                    |                                                                                       | Yes         |
| Costus brasiliensis Schum./Cana-de-macaco | Not found                  | Calmative [67]                 | Not found                                                                                           | Not found                                                                             |             |
| Viola odorata L./      |                            | * * *                           | Sedative [87]                                                                                      | Antitumoral [352], antioxidant and antibacterial [353], antimicrobial [354], vasodilator and antidyslipidemic [355] | Yes         |

* It is the popular name that was quoted. ** It was not mentioned how to prepare. *** It is the portion used or how to prepare that was quoted.

Figure 1: The cited families of medicinal plants according to popular knowledge.

Parts most commonly used, but, in 18% of the studied plants, there were no citations about the used part for making medicines (Figure 3).

The most common preparation methods provided in the surveys were infusion (59/167) and decoction (49/167), representing 63.7% of all the methods (Figure 4).

Common effects attributed to the plants in the ethnopharmacological surveys were antioxidant (42/401), anti-inflammatory (31/401), antibacterial (20/401), and antimicrobial (17/401), totaling 31.9% (Figure 5).

Comparison between ethnopharmacological data and pharmaceutical tests for the same plants and compounds found differences in 52.9% (73/138) of the cases and similarities in 30.4% (42/138) (Figure 6). No pharmacological tests were found for 16.9% (23/138) of the plants mentioned in the ethnopharmacological surveys (Table 1).
Evidence-Based Complementary and Alternative Medicine

Population since anti-inflammatory agents are effective in treating pain diseases.

4. Discussion

The most frequent indications of medicinal plant use for neural system disorders in our survey (i.e., calmative, analgesic, headache, and insomnia) are associated with the most common occurrences seen in medical practice [7, 36, 47, 55, 68, 77, 104, 132, 235, 258] (Figure 2).

The plant families analyzed (Lamiaceae and Asteraceae) are in accordance with general ethnobotanical studies [4, 7, 379–382] (Figure 1), as well as the most utilized plant parts (leaves) [1, 7, 379, 383, 384], and preparation methods (infusion and decoction) [7, 253, 379, 383, 384] (Figure 4).

Despite that, the frequency of effects observed by most pharmacological tests does not coincide with those reported for the same plants when analyzed by ethnopharmacological means, (i.e., antioxidant, anti-inflammatory, antibacterial, and antimicrobial), demonstrating a high discrepancy between proven and popularly mentioned effects (Figure 6).

It is important to remember that results of pharmacological tests were not found for all the plants mentioned in the ethnopharmacological studies, although those represent a small minority (16.9%) (Figure 5).

The discrepancy rate between the effects observed by ethnopharmacological and pharmacological methods in this study is in agreement with a previous study [9] and, in both cases, a disagreement of over 50% was found. This data indicates the need for better control in the use of medicinal plants as a whole, especially in countries with a large proportion of economically backward population where such therapy is most common, such as China, India, and Brazil. However, there are possibilities that scientific studies are not enough or they are missing to corroborate the ethnopharmacological activities.

Tables like the one produced in this study can be used as a basis for the indication of medications for health professionals working in the neural area who choose to substitute alternative therapies with conventional methods. The tables can be used to maintain the patient’s health and help make these treatments more accessible to people of all economic levels [385], bring medical practice closer to the care of cultural groups [386], and expand the idea of wholeness in healthcare.

Performing pharmacological tests in the medicinal plants mentioned in ethnopharmacological studies will help avoid prescription errors based only on popular knowledge, which, despite the importance, exhibits extensive methodological shortcomings from its propagation through generations (see Introduction). Although the pharmacological tests cannot solve problems related to contamination during preparation and/or mistakes when identifying plants by unskilled people, performing those tests would decrease the problems caused by adverse effects and wrong prescriptions.

Neurological disorders present complex etiologies often with aggravating social influences, requiring special care when making prescriptions; many critically ill patients are secluded from society and require medical monitoring and medications derived from modern pharmaceutical technology since indications for complex etiologies like dementias were not addressed in the ethnopharmacological articles analyzed in this study.
In conclusion, despite the importance of ethnopharmacological data, it is important to make comparisons with pharmacological tests for the same plants, since the pharmacological studies, although few, have shown a high rate of discrepancy in the results, nevertheless, to be important to cite that the scientific studies could not be enough, or are missing, to corroborate the ethnopharmacological activities. Tables containing the plants names and their effects according to pharmacological tests should be consulted by health professionals before prescribing those medications. No medicinal plants were mentioned in ethnopharmacological data for treating complex etiology neural disorders such as dementia, indicating the need for new studies of broader geographical amplitude and pharmaceutical classes all around the world. Emphasis of these studies should occur in developing countries in order to decrease prescription...
errors associated with medicinal plants and increase the coverage of plant-based therapy for the global population while prioritizing people in need.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Acknowledgments

Tales Alexandre Aversi-Ferreira acknowledges CNPq, Brazil, for scholarship in productivity research.

References

[1] T. M. B. Garlet and B. E. Irgang, “Medicinal plants used in folk medicine by rural women workers in Cruz,” Revista Brasileira de Plantas Medicinais, vol. 4, no. 1, pp. 9–18, 2001.

[2] N. F. Grynberg, A. Echevarria, M. A. M. Maciel, A. C. Pinto, and P. V. F. Veiga Junior, “Plantas medicinais: a necessidade de estudos multidisciplinares,” Química Nova, vol. 25, no. 3, pp. 429–438, 2002.

[3] H. A. Rezende and M. I. Cocco, “The phytoterapy utilization in the rural population routine,” Revista da Escola de Enfermagem da USP, vol. 36, no. 3, pp. 282–288, 2002.

[4] E. Rodrigues and E. A. Carlini, “Possible effects on the Central Nervous System of plants used by two Brazilian cultures (Maroons and Indians),” Arquivos Brasileiros de Fitomedicina Científica, vol. 11, no. 3, pp. 368–380, 2002.

[5] N. B. Vale, “A farmacobotânica, ainda tem lugar na moderna anestesiologia?” Revista Brasileira de Anestesiologia, vol. 52, no. 3, pp. 147–154, 2003.

[6] I. S. França, J. A. Souza, R. S. Baptista, and V. R. Britto, “Medicina popular: benefícios e malefícios das plantas medicinais,” Revista Brasileira de Enfermagem, vol. 61, no. 2, pp. 201–208, 2008.

[7] N. P. Soares, A. Camilo Neves, T. de Abreu, G. de Abreu Pfrimer, H. Nishiyo, and T. A. Aversi-Ferreira, “Medicinal plants used by the population of Goianápolis, Goiás State, Brazil,” Acta Scientiarum - Biological Sciences, vol. 35, no. 2, pp. 263–271, 2013.

[8] H. Gómez-Estrada, F. Díaz-Castillo, L. Franco-Ospina et al., “Folk medicine in the northern coast of Colombia: an overview,” Journal of Ethnobiology and Ethnomedicine, vol. 7, no. 1, pp. 27–37, 2011.

[9] T. A. Aversi-Ferreira, P. P. Ribeiro, N. C. Silva et al., “Confrontation between ethnopharmacology and scientific results of the herbal medicaments from Brazil to be applied in primary health care,” Journal of Medicinal Plants Research, vol. 7, no. 4, pp. 845–856, 2013.

[10] F. Cuassolo, A. Ladio, and C. Ezcurre, “Aspectos de la comercialización y control de calidad de las plantas medicinales más vendidas en una comunidad urbana del no de la Patagonia Argentina,” Boletín Latinoamericano y del Caribe de Plantas Medicinales y Aromáticas, vol. 9, no. 3, pp. 166–176, 2009.

[11] S. Coulaud-Cunha, R. S. Oliveira, and W. Waissmann, “Sale free Sorococa bomplandii Bailon as Espinheira Santa in the city of Rio de Janeiro-RJ,” Revista Brasileira de Farmacognosia, vol. 14, no. 4, pp. 51–53, 2004.

[12] D. S. M. Andreiolo, L. H. Cunha, A. S. Santana et al., “Investigações da presença de anorexígenos, benzodiazepínicos e antidepressivos em formulações fitoterápicas emagrecedoras,” Revista do Instituto Adolfo Lutz, vol. 71, no. 1, pp. 148–152, 2012.

[13] S. R. Souza, M. O. F. Amaro, M. B. Rosa, and C. A. Carvalho, “Avaliação do conhecimento etnofarmacológico da população de Teixeiras-MG,” Revista de Ciências Farmacêuticas Básica e Aplicada, vol. 34, no. 4, pp. 559–563, 2013.

[14] F. Q. Oliveira and L. A. Gonçalves, “Knowledge on medicinal plants and phythomedicines and potential of toxicity by users from Belo Horizonte, Minas Gerais,” Revista Eletrônica de Farmácia, vol. 3, no. 2, pp. 36–41, 2006.

[15] M. I. Tomazzoni, R. R. B. Negrelle, and M. L. Centa, “Popular phytotherapy: the instrumental search as therapy,” Texto e Contexto de Enfermagem, vol. 15, no. 1, pp. 115–121, 2006.

[16] K. S. M. Rates, “Promoting the rational use of herbal medicines: an approach to teaching pharmacognosy,” Revista Brasileira de Farmacognosia, vol. 11, no. 2, pp. 57–69, 2001.

[17] V. Maioli-Azevedo and V. F. Fonseca-Kruel, “Medicinal and ritual plants sold in street markets of Rio de Janeiro, RJ, Brazil,” Acta Botânica Brasílica, vol. 27, no. 2, pp. 263–275, 2007.

[18] M. D. Chaves and T. A. Aversi Ferreira, “Terapia medicamentosa da doença de Alzheimer,” Revista Eletrônica de Farmácía, vol. 5, no. 1, pp. 1–7, 2008.

[19] M. I. Silva, A. P. Gondim, I. F. Nunes, and F. C. Sousa, “Utilização de fitoterápicos nas unidades básicas de atenção à saúde da família do município de Maracanaú (CE),” Revista Brasileira de Farmacognosia, vol. 6, no. 1, pp. 455–462, 2006.
Evidence-Based Complementary and Alternative Medicine

[20] P. D. Albertasse, L. D. Thomaz, and M. A. Andrade, "Plantas medicinais e seus usos na comunidade da Barra do Jucu, Vila Velha, ES," Revista Brasileira de Plantas Medicinais, vol. 12, no. 3, pp. 250–260, 2010.

[21] R. R. B. Negrelle and K. R. C. Fornazzari, "Estudo etnobotânico em duas comunidades rurais (Limeira e Ribeirão Grande) de Guaratatuba (Paraná, Brasil)," Revista Brasileira de Plantas Medicinais, vol. 9, no. 2, pp. 36–54, 2007.

[22] R. H. Alabashi and M. F. Melzig, "Plectranthus barbatus: a review of phytochemistry, ethnobotanical and pharmacology - part I," Planta Medica, vol. 76, no. 7, pp. 653–661, 2010.

[23] T. M. Miranda and N. Hanazaki, "Conhecimento e uso de recursos vegetais de restinhas por comunidades das ilhas Cardoso (SP) e de Santa Catarina (SC)," Acta Botanica Brasilia, vol. 22, no. 1, pp. 203–215, 2008.

[24] E. S. Garcia, A. C. P. Gilbert, C. B. V. Corrêa, M. V. S. Cavalheiro, T. E. Venâncio, "Estudo dos efeitos comportamentais e neuromusculares do extrato hidro-alcoólico de Echinodorus grandiflorus (chapeús-de-couro) em ratos espontaneamente hipertensos," in Dissertação, Instituto Oswaldo Cruz, Rio de Janeiro, Brazil, 2011.

[25] M. A. Lessa, C. V. Araújo, M. A. Kaplan, D. Pimenta, M. R. Figueiredo, and E. Tibirica, "Antihypertensive effects of crude extracts from leaves of Echinodorus grandiflorus," Fundamental & Clinical Pharmacology, vol. 22, no. 2, pp. 161–168, 2008.

[26] M. D. Silva, S. Dreveck, and A. L. B. Zeni, "Estudo etnobotânico de plantas medicinais utilizadas pela população rural no entorno do Parque Nacional da Serra do Itajai – Indaiá," Revista Saúde e Ambiente, vol. 10, no. 2, pp. 54–64, 2009.

[27] C.-H. Wu, H.-T. Hsieh, J.-A. Lin, and G.-C. Yen, "Alternanthera paronychoides protects pancreatic β-cells from glucotoxicity by its antioxidant, antiapoptotic and insulin secretagogue actions," Food Chemistry, vol. 139, no. 1-4, pp. 362–370, 2013.

[28] V.-G. Jorge, J.-R. L. Angel, T.-S. Adrián et al., "Vasorelaxant activity of extracts obtained from Apium graveolens: Possible source for vasorelaxant molecules isolation with potential antihypertensive effect," Asian Pacific Journal of Tropical Biomedicine, vol. 3, no. 10, pp. 776–779, 2013.

[29] V. P. Mosca and M. I. B. Loiola, "Uso popular de plantas medicinais no rio grande do norte, nordeste do Brasil," Revista Caatinga, vol. 22, no. 4, pp. 225–234, 2009.

[30] E. d. Melo, J. Mancini Filho, N. B. Guerra, and G. R. Maciel, "Atividade antioxidante de extratos de coentro (Coriandrum sativum L.)" Ciência e Tecnologia de Alimentos, vol. 23, no. 1, pp. 195–199, 2003.

[31] G. Zanussi-Junior, J. Melo, A. Romero et al., "Avaliação da atividade antiinflamatória do coentro (Coriandrum sativum L.) em roedores," Revista Brasileira de Plantas Medicinais, vol. 13, no. 1, pp. 17–23, 2011.

[32] V. Z. Pedrosa, "Atividade do Coriandrum sativum L. sobre cepas de Escherichia coli produtoras de β-lactamases de espectro estendido," in Tese, Centro de Ciências de Saúde, Universidade Federal da Paraíba, 2014.

[33] M. Emamghoreishi, M. Khasaki, and M. F. Azam, "Coriandrum sativum: Evaluation of its anxiolytic effect in the elevated plus-maze," Journal of Ethnopharmacology, vol. 96, no. 3, pp. 365–370, 2005.

[34] I. A. Freires, R. M. Murata, V. F. Furletti et al., "Coriandrum sativum L. (Coriander) essential oil: antifungal activity and mode of action on Candida spp., and molecular targets affected in human whole-genome expression," PLoS ONE, vol. 9, no. 3, pp. 1–13, 2014.

[35] S. Sreelatha and R. Inbavalli, "Antioxidant, antihyperglycemic and antihyperlipidemic effects of Coriandrum sativum Leaf and stem in alloxan-induced diabetic rats," Journal of Food Science, vol. 77, no. 7, pp. 119–123, 2012.

[36] A. A. Taherian, A. A. Vafaei, and J. Ameri, "Opiate system and antihyperlipidemic activities of Justicia pectoralis Jacq. and its main constituents: Coumarin and umbelliferone," Phytotherapy Research, vol. II, no. 3, pp. 211–215, 1997.

[37] T. D. Locklear, Y. Huang, J. Frasor et al., "Estrogenic and progestagenic effects of extracts of Justicia pectoralis Jacq. an herbal medicine from Costa Rica used for the treatment of Menopause and PMS," Maturitas, vol. 66, no. 3, pp. 315–322, 2010.

[38] G. P. Trueba, R. R. Martinez, Z. P. Ruiz, and J. R. Chanfrau, "Evaluación de la actividad antioxidante de Justicia Pectoralis," Revista cubana de Investigaciones Biomedicas, vol. 20, no. 1, pp. 30–33, 2001.

[39] R. C. Dutra, C. Z. Tavares, S. O. Ferraz, O. V. Sousa, and D. S. Pimenta, "Investigação das atividades analgésica e antiinflamatória do extrato metanóico dos rizomas de Echinodorus grandiflorus," Brazilian Journal of Pharmacognosy, vol. 16, no. 4, pp. 469–474, 2006.

[40] G. L. C. Cardoso, N. A. Pereira, and R. Lainetti, "Avaliação das atividades antiinocicativa, antiinflamatória e diurética do chapéu-de-couro (Echinodorus grandiflorus, [Cham & Schl] Mitch, Alismataceae)," Revista Brasileira de Farmacologia, vol. 84, no. 1, pp. 5–7, 2003.

[41] G. F. Conceição, "Efeitos anti-hipertensivos e microcirculatórios do extrato hidró-alcoólico de Echinodorus grandiflorus (chapéus-de-couro) em ratos espontaneamente hipertensos," in Dissertação, Instituto Oswaldo Cruz, Rio de Janeiro, Brazil, 2011.
etnobotânico de plantas medicinais na cidade de São João da Ponte-MG," Revista de Biologia e Farmácia, vol. 7, no. 1, pp. 122–131, 2012.

[50] V. N. Trajano, E. d. Lima, E. L. Souza, and A. E. Travassos, “Propriedade antibacteriana de óleos essenciais de especiarias sobre bactérias contaminantes de alimentos,” Ciência e Tecnologia de Alimentos, vol. 29, no. 3, pp. 542–545, 2009.

[51] F. Karimzadeh, M. Hosseini, D. Mangeng et al., “Anticonvulsant and neuroprotective effects of Pimpinella anisum in rat brain,” BMC Complementary and Alternative Medicine, vol. 12, no. 7, pp. 1–10, 2012.

[52] J.-B. Lee, C. Yamagishi, K. Hayashi, and T. Hayashi, “Antiviral and immunostimulating effects of lignin-carbohydrate-protein complexes from Pimpinella anisum,” Bioscience, Biotechnology, and Biochemistry, vol. 75, no. 3, pp. 459–465, 2011.

[53] I. Gülçin, M. Oktay, E. Kireçci, and Ö. I. Küfrevoğlu, “Screening of antioxidant and antimicrobial activities of anise (Pimpinella anisum L.) seed extracts,” Food Chemistry, vol. 83, no. 3, pp. 371–382, 2003.

[54] S. Kadan, M. Rayan, and A. Rayan, “Anticancer activity of anise (Pimpinella anisum L.) seed extract,” The Open Naturopathic Journal, vol. 6, no. 1, pp. 1–5, 2013.

[55] A. H. C. Meretika, N. Peroni, and N. Hanazaki, “Local knowledge of medicinal plants in three artisanal fishing communities (Itapoá, Southern Brazil), according to gender, age, and urbanization,” Acta Botanica Brasilica, vol. 24, no. 2, pp. 386–394, 2010.

[56] C. T. A. Cruz-Silva, A. P. Pelinson, and A. M. Campelo, “Abordagem etnobotânica acerca do uso de plantas medicinais na região urbana no município de Quedas do Iguaçu - Paraná,” Cultivando o Saber, vol. 2, no. 1, pp. 14–25, 2009.

[57] M. A. Pilla, M. C. Amorozo, and A. Furlan, “Obtenção e uso das plantas medicinais no distrito de Martim Francisco, Município de Mogi-Mirim, SP, Brasil,” Acta Botanica Brasilica, vol. 20, no. 4, pp. 789–802, 2006.

[58] S. B. Fuck, J. C. Athanázio, C. B. Lima, and L. C. Ming, “Plantas medicinais utilizadas na medicina popular por moradores da área urbana de Bandeirantes, PR, Brasil,” Semina: Ciências Agrárias, vol. 26, no. 3, pp. 291–296, 2005.

[59] N. F. L. Almeida, S. R. S. Silva, J. M. Souza, A. P. N. Queiroz, G. S. Miranda, and H. B. Oliveira, “Levantamento etnobotânico de plantas medicinais na cidade de Viçosa-MG,” Revista Brasileira de Ciências Farmacêuticas, vol. 90, no. 4, pp. 316–320, 2009.

[60] A. G. Martins, D. L. Rosário, M. N. Barros, and M. A. G. Jardim, “Levantamento etnobotânico de plantas medicinais, alimentares e tóxicas da Ilha do Combu, Município de Belém, Estado do Pará, Brasil,” Revista Brasileira de Farmácia, vol. 26, no. 1, pp. 21–30, 2005.

[61] M. T. Tinoco, M. R. Martins, and J. Cruzmorais, “Atividade antimicrobiana do óleo essencial do Foeniculum vulgare Miller,” Revista de Ciências Agrárias, vol. 30, no. 1, pp. 448–454, 2013.

[62] D. Beaux, J. Fleurentin, and F. Mortier, “Diuretic action of hydroalcoholic extracts of Foeniculum vulgare var dulce (D.C.) roots in rats,” Phytotherapy Research, vol. 11, no. 4, pp. 320–322, 1997.

[63] K. A. L. Wakabayashi, N. I. De Melo, D. P. Aguiar et al., “Anthemimtic effects of the essential oil of fennel (Foeniculum vulgare, Apiaceae) against Schistosoma mansoni,” Chemistry & Biodiversity, vol. 12, no. 7, pp. 1105–1114, 2015.

[64] E. Mansouri, W. Kooti, M. Bazvand et al., “The effect of hydroalcoholic extract of Foeniculum vulgare mill on leukocytes and hematological tests in male rats,” Jundishapur Journal of Natural Pharmaceutical Products, vol. 10, no. 1, pp. 1–5, 2015.

[65] M. Mesfin, K. Asres, and W. Shibeshi, “Evaluation of anxiolytic activity of the essential oil of the aerial part of Foeniculum vulgare Miller in mice,” BMC Complementary and Alternative Medicine, vol. 14, no. 310, pp. 1–7, 2014.

[66] S. C. Gnoatto, V. L. Bassani, G. C. Coelho, and E. P. Schenkel, “The effect of Pimpinella anisum in rat brain,” Indian Journal of Pharmaceutics, vol. 79, no. 3, pp. 99–102, 2017.

[67] A. C. Ortiz and M. C. M. Lombardo, “Cultivo de plantas medicinais em objetos antigos de Palombas,” Acta Pharmaceutica voucher, vol. 25, no. 1, pp. 64–70, 2006.

[68] F. Lopes, M. Placeres, R. Moreira, L. d. Santos, and I. Carlos, “Análise de perfil fitoquímico de Aristolochia esperanzae Kuntze (Aristolochiaceae) in Serra da Bocaina, Brazil,” Revista Brasileira de Farmácia, vol. 20, no. 3, pp. 177–184, 2010.

[69] E. F. de M. F. Lopes, M. Placeres, R. Moreira, L. d. Santos, and I. Carlos, “Avaliação da atividade antimicrobiana de Aristolochia esperanzae Kuntze (Aristolochiaceae) in Serra da Bocaina, Brazil,” Revista Brasileira de Farmácia, vol. 20, no. 3, pp. 177–184, 2010.

[70] M. R. Brito and L. d. Senna-Valle, “Plantas medicinais utilizadas in comunidade caçara da Praia do Sono, Paraty, Rio de Janeiro, Brazil,” Acta Botanica Brasilica, vol. 25, no. 1, pp. 363–372, 2011.

[71] A. M. Borba and M. Macedo, “Plantas medicinais usadas para a saúde bucal pela comunidade do bairro Santa Cruz, Chapada dos Guimarães, MT, Brasil,” Acta Botanica Brasilica, vol. 20, no. 4, pp. 771–782, 2006.

[72] M. J. Ruffa, G. Ferraro, M. L. Wagner, M. L. Calcagno, R. H. Campos, and L. Cavallaro, “Cytotoxic effect of Argentine medicinal plant extracts on human hepatocellular carcinoma cell line,” Journal of Ethnopharmacology, vol. 79, no. 3, pp. 335–339, 2002.
evaluation of the vegetal drug and preliminary optimization studies on extraction. Caderno de Farmácia, vol. 17, 2001.

[81] R. P. J. M. Bettega, “Avaliação da atividade antiviral de extratos nebulizados de Achyrocline satureioides (Lam) D C. Astereaceae - Marcela,” in Dissertação, Universidade Federal de Santa Catarina, Florianópolis, Brazil, 2000.

[82] J. J. Ochoa, A. H. Ladio, and M. Lozada, “Uso de recursos herborários para el tratamiento de gástrico doloroso por el Caribe de Plantas Medicinales y Aromáticas, vol. 9, no. 4, pp. 269–276, 2010.

[83] G. Shafi, T. N. Hasan, N. A. Syed et al., “Artemisia absinthium (AA): A novel potential complementary and alternative medicine for breast cancer,” Molecular Biology Reports, vol. 39, no. 7, pp. 7373–7379, 2012.

[84] D. Obistiu, R. T. Cristina, I. Schmerold et al., “Chemical characterization by GC-MS and in vitro activity against Candida albicans of volatile fractions prepared from Artemisia dracunculus, Artemisia abrotanum, Artemisia absinthium and Artemisia vulgaris,” Chemistry Central Journal, vol. 8, no. 6, pp. 1–11, 2014.

[85] H. R. Moslemi, H. Hoseinzadeh, M. A. Badouei, K. Shadhowuzan, and R. M. N. Fard, “Antimicrobial activity of Artemisia absinthium against surgical wounds infected by Staphylococcus aureus in a rat model,” Indian Journal of Microbiology, vol. 52, no. 4, pp. 601–604, 2012.

[86] Y. Tariku, A. Hymete, A. Hailu, and J. Rohloff, “In vitro evaluation of antileishmanial activity and toxicity of essential oils of Artemisia absinthium and Echinops kebericho,” Chemistry & Biodiversity, vol. 8, no. 4, pp. 614–623, 2011.

[87] D. C. Gallotte and L. F. Ribeiro, “Levantamento etnobotânico das plantas medicinais do horto da Escola Superior São Francisco de Assis - ESFA, Santa Teresa, ES,” Natureza Online, vol. 3, no. 1, pp. 19–24, 2005.

[88] V. F. Noldin, V. Cechinel Filho, F. D. Monache et al., “Combinação de phaseolus vulgaris e cynara scolymus L. (alcachofra) cultivada no Brasil,” Journal of Natural Medicines, vol. 62, no. 3, pp. 284–293, 2006.

[89] F. H. Al-Hashem, “Gastroprotective effects of aqueous extract of chamomilla recutita against ethanol-induced gastric ulcers,” Arabian Journal of Biological Sciences, vol. 18, no. 5, pp. 279–286, 1997.

[90] F. J. Luz, “Plantas medicinais de uso popular em Boa Vista, Roraima, Brasil,” Horticultura Brasileira, vol. 19, no. 1, pp. 88–96, 2001.

[91] S. N. Harsha, K. R. Anilakumar, and M. V. Mithila, “Antioxidant properties of Lactuca sativa leaf extract involved in the protection of biomolecules,” Biomedicine & Preventive Nutrition, vol. 3, no. 4, pp. 367–373, 2013.

[92] M. F. Medeiros, V. S. Fonseca, and R. H. Andreata, “Plantas medicinais e seus usos pelos sitiantes da Reserva do Rio das Pedras, Mangaratiba, RJ, Brasil,” Acta Botanica Brasilica, vol. 18, no. 2, pp. 391–399, 2004.

[93] I. M. Madaleno, “Etnofarmacologia em Iberoamérica, uma alternativa para a valorização de práticas de cura,” Cuadernos Geográficos, vol. 41, no. 2, pp. 61–95, 2008.

[94] C. V. E. a. A. Rodrigues and D. Carvalho, “Florística de plantas medicinais nativas de remanescentes de floresta estacional semidecidual na região de Alto do Rio Grande- Minas Gerais,” Revista Cerne, vol. 15, no. 3, pp. 93–112, 2005.

[95] H. R. N. Salgado, A. F. F. Roncar, and R. R. D. Moreira, “Antidiarrhoeal effects of Mikania glomerata spreng. (Asteraceae) leaf extract in mice,” Revista Brasileira de Farmacognosia, vol. 15, no. 3, pp. 205–208, 2005.

[96] F. Assini, E. Fabricio, and K. Lang, “Efeitos farmacológicos do extrato aquoso de Solidago chilensis Meyen em camundongos,” Revista Brasileira de Plantas Medicinais, vol. 15, no. 1, pp. 130–134, 2013.

[97] F. G. C. Costa, F. G. C. C. Nunes, and V. Peres, “Maapeamento etnofarmacológico e etnobotânico de espécies de cerrado, na microregião de Patos de Minas,” Revista do Núcleo Interdisciplinar de Pesquisa e Extensão, vol. 2, no. 7, pp. 93–111, 2010.

[98] M. A. Nascimento, “Polissacarídeos e metabólitos secundários de Sphanchus olaracea L. (Jambu),” in Dissertação, Departamento de Bioquímica e Biologia Molecular, Setor de Ciências Biológicas, Universidade Federal do Paraná, 2012.

[99] G. Pessini, F. Holez, N. Sanches, D. Cortez, B. Dias Filho, and C. Nakamura, “Avaliação da atividade antibacteriana e antifúngica...
de extratos de plantas utilizados na medicina popular," Revista Brasileira de Farmacognosia, vol. 13, no. 1, pp. 21–24, 2003.

[110] A. L. Alvarez, S. Habtemariam, M. Juan-Badurute, C. Jackson, and F. Parra, "In vitro anti HSV-1 and HSV-2 activity of Tanacetum vulgare extracts and isolated compounds: an approach to their mechanism of action," Phytotherapy Research, vol. 25, no. 2, pp. 296–301, 2011.

[111] S. Rosselli, M. Bruno, F. M. Raimondo et al., "Cytotoxic effect of eudesmanolides isolated from flowers of Tanacetum vulgaressp. Siculum," Molecules, vol. 17, no. 7, pp. 8186–8195, 2012.

[112] P. S. Luize, T. S. Tiuman, L. G. Morello et al., "Effects of medicinal plant extracts on growth of Leishmania (L.) amazonensis and Trypanosoma cruzi," Brazilian Journal of Pharmaceutical Sciences, vol. 41, no. 1, pp. 85–94, 2005.

[113] G. Xie, I. A. Schepetkin, and M. T. Quinn, "Immunomodulatory activity of acidic polysaccharides isolated from Tanacetum vulgare L.," International Immunopharmacology, vol. 7, no. 13, pp. 1639–1650, 2007.

[114] L. S. Godinho, L. S. A. de Carvalho, C. C. B. de Castro et al., "Antihelmintic activity of crude extract and essential oil of Tanacetum vulgare (Asteraceae) against adult worms of schistosoma mansoni," The Scientific World Journal, vol. 2014, Article ID 460342, 10 pages, 2014.

[115] T. Pagno, L. Z. Blind, M. W. Biavatti, and M. R. O. Kreuger, "Cytotoxic activity of the dichloromethane fraction the Vernonia alfredii (Asteraceae) against Ehrlich's tumor cells in mice," Brazilian Journal of Medical and Biological Research, vol. 39, no. 11, pp. 1483–1491, 2006.

[116] C. E. Silva, R. Valota, K. S. Gebara, R. C. Silva, and E. Simionatto, "Avaliação da atividade antioxidante e o teor de compostos fenólicos em extrato metanólico obtido de folhas da Comphihora Myrrha," Semina: Ciências Exatas e Tecnológicas, vol. 34, no. 1, pp. 117–124, 2013.

[117] G. Vila Verde, J. Paula, and D. Caneiro, "Levantamento etnobotânico das plantas medicinais do cerrado utilizadas pela população de Mossâmedes (GO)," Revista Brasileira de Farmacognosia, vol. 13, no. 1, pp. 64–66, 2003.

[118] C. L. Chiaregatto, "Efeito do tratamento crônico com extratos de Heteropogon arenarium (L.) Pers. (Asteraceae) contra a glicose resistente em camundongos," Acta Botanica Brasilica, vol. 19, no. 1, pp. 39–44, 2005.

[119] L. d. Pinho, P. N. Souza, E. Macedo Sobrinho, A. C. Almeida, and E. R. Martins, "Atividade antioxidante e antitumoral de extratos de folhas de alecrim-pimenta, aroeira, barbatimão, erva baleeira e do farêlo de casca de pequi," Ciência Rural, vol. 42, no. 2, pp. 326–331, 2011.

[120] S. P. Pimentel, G. E. Barrella, R. C. V. Casarin et al., "Protective effect of topical Cordia verbenacea in a rat periodontitis model: immune-inflammatory, antibacterial and morphometric assays," BMC Complementary and Alternative Medicine, vol. 12, no. 224, pp. 1–8, 2012.

[121] A. C. Nitz, J. B. Ely, A. J. D’Acompora, D. R. Tames, and B. P. Corrêa, "Estudo morfológico no processo de cicatrização de feridas cutâneas em ratos, usando: Coronopou didymus e Calendula officinalis," Arquivos Catarinenses de Medicina, vol. 35, no. 4, pp. 74–79, 2006.

[122] T. C. P. M. Busnardo, C. Padoani, T. C. Mora et al., "Antinflammatory evaluation of Coronopus didymus in the pleurisy and paw edema models in mice," Journal of Ethnopharmacology, vol. 128, no. 2, pp. 519–525, 2010.

[123] S. N. Fracaro, T. Nakashima, and I. Deconto, "Potencial abortivo de Tillandsia usneoides L. (barba-de- pe) em coelhas gestantes- Nota prévia," Arquivos de Ciências Veterinárias e Zoologia da UNIPAR, vol. 7, no. 2, pp. 181–185, 2014.

[124] C. R. Andrietti-Fröhner, T. C. M. Sincero, A. C. Coelho et al., "Antiviral evaluation of plants from Brazilian Atlantic Tropical Forest," Fitoterapia, vol. 76, no. 3–4, pp. 374–378, 2005.

[125] D. M. S. Oliveira, F. M. M. Ocampo, T. F. Moreira et al., "Physico-Chemical assays, hemolytic, and antimicrobial activity of extracts and fractions of Buddleja stachyoides Cham and Schoedl. (Schrophulariaceae)," Visão Acadêmica, vol. 14, no. 3, pp. 14–25, 2013.

[126] S. Su, T. Wang, J. Duan et al., "Anti-inflammatory and analgesic activity of different extracts of Comphophora myrrha," Journal of Ethnopharmacology, vol. 134, no. 2, pp. 251–258, 2011.

[127] D. C. Damasceno, G. T. Volpato, I. de Mattos Paranhos Calderon, R. Aguilar, and M. V. C. Rudge, "Effect of Bauhinia forficata extract in diabetic pregnant rats: Maternal repercussions," Phytomedicine, vol. 11, no. 2-3, pp. 196–201, 2004.

[128] E. Dúsmán, I. V. D. Almeida, A. C. Coelho, T. J. Balbi, L. T. Dúsmán Tonin, and V. E. P. Vicentini, "Antimutagenic effect of medicinal plants achillea millefolium and bauhinia forficata in vivo," Evidence-Based Complementary and Alternative Medicine, vol. 2013, Article ID 893050, 6 pages, 2013.

[129] M. G. V. Marinho, C. C. Silva, and L. H. C. Andrade, "Levantamento etnobotânico de plantas medicinais em áreas de caatinga no município de São José de Espinharas, Parába, Brasil," Revista Brasileira de Plantas Medicinais, vol. 13, no. 2, pp. 170–180, 2011.

[130] S. R. Leal, "Estudo etnopharmacológico e fitoquímico espécies medicinais Cleome spinosa Jacq. Pavonia varians Moric e Croton cajucara Benth.," in Tese, Universidade Federal do Rio Grande do Norte, Centro de Ciências exatas e da terra, 2008.

[131] N. Albarello, C. Simões-Gurgel, T. C. Castro et al., "Antinflammatory and anticoagulant activity of fieldgrowing plants and tissue culture of Cleome Spinosa (Jacq.) in mice," Journal of Medicinal Plants Research.

[132] M. Scopel, "Análise botânica, química e biológica comparativa entre flores das espécies Sambucus nigra L. e Sambucus australis Chan e Schidl. avaliação preliminar de sua estabilidade," in Dissertação, Faculdade de Farmácia, Programa de Pós Graduação em Ciências Farmacêuticas, 2005.

[133] A. Daryani, M. A. Ebrahimzadeh, M. Sharif et al., "Antitoxoplasmatic activity of methanol extract of sambucus nigra (caprifoliaceae) fruits and leaves," Revista de Biologia Tropical, vol. 63, no. 1, pp. 7–12, 2015.

[134] E. N. Bum, S. Soudi, E. R. Ayissi et al., "Anxiolityc activity evaluation of four medicinal plants from Cameroon," African Journal of Traditional, Complementary and Alternative Medicines, vol. 8, no. 5, pp. 130–139, 2011.

[135] L. F. Dias, E. S. Melo, L. S. Hernandes, and E. M. Bacchi, "Atividades antimicrobianas e antioxidantes de Baccharis trimera (Less) DC (Asteraceae);" Revista Brasileira de Farmacognosia, vol. 19, no. 1, pp. 309–314, 2009.

[136] R. A. Lima, S. A. Magalhães, and M. R. A. Santos, "Levantamento etnobotânico de plantas medicinais utilizadas na cidade de ...
Evidence-Based Complementary and Alternative Medicine

de Vilhena, Rondônia,” Revista Pesquisa e Criação, vol. 10, no. 2, pp. 112–123, 2011.

[139] E. L. Paul, A. Lunardelli, E. Caberlon et al., “Anti-inflammatory and immunomodulatory effects of Bacharis trimera aqueous extract on induced pleurisy in rats and lymphoproliferation In Vitro,” Inflammation, vol. 32, no. 6, pp. 419–425, 2009.

[140] R. M. Gené, C. Cartañá, T. Adzet, E. Marín, T. Parella, and S. Canigueral, “Anti-inflammatory and analgesic activity of Bacharis trimera: identification of its active constituents,” Planta Medica, vol. 62, no. 3, pp. 232–235, 1996.

[141] A. L. Valverde, G. L. C. Cardoso, N. A. Pereira, A. J. R. Silva, and R. M. Kuster, “Analgesic and anti-inflammatory activities of vernonioside B2 from Vernonia condensata,” Phytotherapy Research, vol. 15, no. 3, pp. 263–264, 2001.

[142] A. G. U. Batista, R. A. Lopes, M. A. Souza et al., “Hepatotoxicidade de plantas medicinais. XLIIX. Ação da infusão de Cayaponia tayuya (Vell.) Cong. no camundongo,” Investigação – Revista Científica da Universidade de Franca, vol. 6, no. 1, pp. 7–12, 2006.

[143] S. Aquila, R. M. Giner, M. C. Recio, E. D. Spegazzini, and J. L. Ríos, “Anti-inflammatory activity of flavonoids from Cayaponia tayuya roots,” Journal of Ethnopharmacology, vol. 121, no. 2, pp. 333–337, 2009.

[144] J. M. Macedo, L. G. P. Souza, V. C. T. Valenzuela, A. B. Oliveira, R. O. Castilho, and R. L. R. P. Jácome, “Variação sazonal nos teores de flavonoides, taninos e atividade antioxidante de Davilla rugosa Poir,” Revista de Ciências Farmacêuticas Básica e Aplicada, vol. 4, no. 5, pp. 585–590, 2013.

[145] L. Guaraldo, J. A. A. Sertiê, and E. M. Bacchi, “Antiulcer action of the hydroalcoholic extract and fractions of Davilla rugosa Poiret in thlle rat,” Journal of Ethnopharmacology, vol. 76, no. 2, pp. 191–195, 2001.

[146] C. M. Feitosa, R. M. Freitas, N. N. N. Luz, M. Z. B. Bezerra, and M. T. S. Trevisan, “Acetylcholinesterase inhibition by some promising Brazilian medical plants,” Brazilian Journal of Biology, vol. 71, no. 3, pp. 783–789, 2011.

[147] E. Oskouiean, N. Abdullah, S. Ahmad, W. Z. Saad, A. R. Omar, and Y. W. Ho, “Bioactive compounds and biological activities of Jatropha curcas L. kernel meal extract,” International Journal of Molecular Sciences, vol. 12, no. 9, pp. 5955–5970, 2011.

[148] O. O. Igbinoso, I. H. Igbinoso, V. N. Chigor et al., “Polyphenolic contents and antioxidant potential of stem bark extracts from jatropha curcas (Linn),” International Journal of Molecular Sciences, vol. 12, no. 5, pp. 2958–2971, 2011.

[149] O. O. Aiyelaagbe, A. A. Hamid, E. Fattorosso, O. Taglialetela-Scafati, H. C. Schröder, and W. E. Müller, “Cytotoxic activity of crude from Jatropha species, plants used extensively in African traditional medicine,” Evidence-Based Complementary and Alternative Medicine, vol. 2011, Article ID 134954, 7 pages, 2011.

[150] V. M. F. Leite, J. B. Pinheiro, M. X. Pisans et al., “In vitro antimicrobial activity of an experimental dentifrice based on Ricinus Communis,” Brazilian Dental Journal, vol. 25, no. 3, pp. 191–196, 2014.

[151] C. S. Silva, P. O. Nunes, C. S. Mesquito, R. C. T. Müller, D. C. Palheta, and K. G. Fernandes, “Avaliação do uso da casca do fruto e das folhas de Caesalpinia ferrea Martius como suplemento nutricional de Fe, Mn e Zn,” Ciência e Tecnologia de Alimentos, vol. 3, no. 30, pp. 751–754, 2010.

[152] A. Oliveira, J. Batista, E. Paiva et al., “Avaliação da atividade cica-trizante do jucá (Caesalpinia ferrea Mart. ex Tül. var. ferrea) em lesões cutâneas de caprinos,” Revista Brasileira de Plantas Medicinais, vol. 12, no. 3, pp. 302–310, 2010.

[153] V. H. Sousa, A. P. O. Barbosa, G. C. Cardoso et al., “Avaliação do potencial antidiabético decinco plantas medicinais em ratos,” Latin American Journal of Pharmacy.

[154] L. S. Magalhães, C. G. Pussente, L. R. Azvedo, and J. M. R. S. Crespo, “Avaliação da atividade antibacteriana do extra do Caesalpinia ferrea Martius e desenvolvimento de uma formulação fitocosmética,” Revista Científica da Faminas, vol. 11, no. 1, pp. 27–43, 2015.

[155] S. A. Dias, A. E. O. Neves, A. B. F. de Ferraz, J. N. Picada, and P. Pereira, “Neuropharmacological and genotoxic evaluation of ethanol extract from Erythrina falcata leaves, a plant used in Brazilian folk medicine,” Revista Brasileira de Farmacognosia, vol. 23, no. 2, pp. 335–341, 2013.

[156] T. Chen, H. Sun, H. Yao et al., “Suppressive effects of Indigofera suffruticosa Mill extracts on lipopolysaccharide- induced inflammatory responses in murine RAW 264.7 macrophages,” Food and Chemical Toxicology, vol. 55, no. 55, pp. 257–264, 2013.

[157] J. L. P. Alejo, R. Miranda, and G. Rodríguez, “Actividad anti-convulsivante (anti-epileptica) del extracto fluido de Indigofera suffruticosa (anil cimarron),” Revista Cubana de Plantas Medicinales, vol. 1, no. 2, pp. 7–10, 1996.

[158] T. G. Calixto, M. E. R. Gonzalez, M. C. P. Wiltshire et al., “Tratamiento eficaz con tintura de a˜nil 5 % de una paciente infestada por Pediculus capitis,” Revista Cubana de Medicina Tropical y Parasitología, vol. 63, no. 3, pp. 275–277, 2011.

[159] G. M. Coelho, “Óleos essenciais para aromaterapia,” in Dissertação, Departamento de Biologia da Escola de Ciências, Universidade do Minho, 2009.

[160] J. G. Melo, V. T. Nascimento, E. L. Amorim, C. S. Andrade Lima, and U. P. Albuquerque, “Avaliação da qualidade de amostras comerciais de boldo (Peumus boldus Molina), pata-de-vaca (Bauhinia spp.) e ginco (Ginkgo biloba L.),” Revista Brasileira de Farmacognosia, vol. 14, no. 2, pp. 111–120, 2004.

[161] I. D. Silva, F. S. Takatsuka, M. R. Rocha, and M. G. Cunha, “Efeito do extrato de sucupira (Pterodon emarginatus Vog.) sobre o desenvolvimento de fungos e bactérias fitopatogênicas,” Pesquisa Agropecuária Tropical, vol. 35, no. 2, pp. 109–115, 2005.

[162] A. P. Santos, D. T. Zatta, W. F. Moraes et al., “Composição química, atividade antimicrobiana do óleo essencial e ocorrência de estóreoides nas folhas de Pterodon emarginatus Vogel, Fabaceae,” Revista Brasileira de Farmacognosia, vol. 20, no. 6, pp. 891–896, 2010.

[163] K. G. L. Bustamante, A. D. F. Lima, M. L. Soares et al., “Avaliação da atividade antimicrobiana do extrato etanólico bruto da casca da sucupira branca (Pterodon emarginatus Vogel)—fabaceae,” Revista Brasileira de Plantas Medicinais, vol. 12, no. 3, pp. 341–345, 2010.

[164] W. F. De Moraes, L. G. De Matos, M. V. Mariano Nascimento et al., “Anti-inflammatory and anti-nociceptive effects of Pterodon emarginatus stem bark alcohol extract,” Pharmaceutical Biology, vol. 47, no. 2, pp. 146–150, 2009.

[165] J. Hoscheid and M. L. Cardoso, “Sucupira as a potential plant for arthritis treatment and other diseases,” Arthritis & Rheumatology, vol. 2015, pp. 1–12, 2015.

[166] B. S. Oken, D. M. Storzbach, and J. A. Kaye, “The efficacy of Ginkgo biloba on cognitive function in Alzheimer disease,” Archives of Neurology, vol. 35, no. 11, pp. 1409–1415, 1998.

[167] S. T. DeKosky, J. D. Williamson, A. L. Fitzpatrick et al., “Ginkgo biloba for prevention of dementia: a randomized controlled trial,” The Journal of the American Medical Association, vol. 300, no. 19, pp. 2253–2262, 2008.
C. S. Passos, M. D. Arbo, S. M. K. Rates, and G. L. von Poser, “Terpenoides com atividade sobre o Sistema Nervoso Central (SNC),” Revista Brasileira de Farmacognosia, vol. 19, no. 1, pp. 140–149, 2009.

M. Bigos, M. Wasiela, D. Kalemba, and M. Sienkiewicz, “Antimicrobial activity of geranium oil against clinical strains of Staphylococcus aureus,” Molecules, vol. 17, no. 9, pp. 10276–10291, 2012.

M. Boukhris, M. Bouaziz, I. Feki, H. Jemai, A. El Feki, and S. Sayadi, “Hypoglycemic and antioxidant effects of leaf essential oil of Pelargonium graveolens L’Her. in alloxan induced diabetic rats,” Lipids in Health and Disease, vol. 11, no. 81, pp. 1–10, 2012.

J. Arroyo, Y. Almora, M. Condorhumán et al., “Efeito do extracto alcoólico de Mimosa pudica (mimosa) sobre a fertilidade en ratas,” Anais da Faculdade de Medicina, vol. 71, no. 4, pp. 265–270, 2011.

N. E. G. Trujillo, I. C. D. Toro, Y. C. Amido, T. R. Gra, L. S. Ojeda, and T. R. Graña, “Hepatotoxicidade aguda da decoccisão de planta Mimosa pudica em ratas Sprague Dawley,” Correo Científico Medico, vol. 18, no. 1, pp. 32–54, 2012.

R. Rajendra and E. Krishnakumar, “Hypolipidemic activity of chloroform extract of Mimosa pudica leaves,” Aviceenna Journal of Medical Biotechnology, vol. 2, no. 4, pp. 215–229, 2010.

F. Y. Sia, J. Vejayan, A. Jamuna, and S. Ambu, “Efficacy of tannins from Mimosa pudica and tannic acid in neutralizing cobra (Naja kaouthia) venom,” Journal of Venomous Animals and Toxins including Tropical Diseases, vol. 17, no. 1, pp. 42–48, 2011.

O. Hernández-Abreu, P. Castillo-España, I. León-Rivera et al., “Antihypertensive and vasorelaxant effects of tilianin isolated from Agastache mexicana are mediated by NO/cGMP pathway,” Antioxidants and Redox Signaling, vol. 13, no. 12, pp. 487–491, 2011.

A. González-Ramírez, M. E. Gonzalez-Trujano, F. Pelleric, and F. J. Lopez-Munoz, “Anti-nociceptive and anti-inflammatory activities of the Agastache mexicana extracts by using several experimental models in rodents,” Journal of Ethnopharmacology, vol. 142, no. 3, pp. 700–705, 2012.

J. Vejayan, A. J. C. R. R. Vejayan et al., “Vasorelaxant activity of Origanum vulgare is mediated through multiple pathways,” BMC Complementary and Alternative Medicine, vol. 11, article no. 96, pp. 1–16, 2011.

R. A. B. Azevedo, “Hepatoprotective effect of water soluble extract of Coleus barbatus on cholesterol in young rats,” Acta Cirurgia Brasileira, vol. 23, no. 3, pp. 220–229, 2008.

S. Felisibino, “Análise Farmacognóstica de Cunila microcephala Benth,” in Memoria, Universidade do Extremo Sul Catarinense, Criciuma, Brazil, 2010.

R. D. C. Paulino, G. P. D. S. A. Henriques, O. N. S. Moura, M. D. F. B. Coelho, and R. A. B. Azevedo, “Medicinal plants at the Sitio do Gois, Apodi, Rio Grande do Norte State, Brazil,” Revista Brasileira de Farmacognosia, vol. 22, no. 1, pp. 29–39, 2011.

S. B. Mishra, A. Verma, A. Mukerjee, and M. Vijayakumar, “Anti-hyperglycemic activity of leaves extract of Hyptis suaveolens L. Poit in streptozotocin induced diabetic rats,” Asian Pacific Journal of Tropical Medicine, vol. 4, no. 9, pp. 689–693, 2011.

H. Ghaffari, B. J. Ghassam, and H. S. Prakash, “Hepatoprotective and cytotoxic properties of Hyptis suaveolens against oxidative stress-induced damage by CCl4 and H2O2,” Asian Pacific Journal of Tropical Medicine, vol. 5, no. 11, pp. 868–874, 2012.

C. Vera-Arzave, L. C. Antonio, J. Arrieta et al., “Gastroprotection of suaveolol, isolated from hyptis suaveolens, against ethanol-induced gastric lesions in wistar rats: Role of prostaglandins, nitric oxide and sulfhydryls,” Molecules, vol. 17, no. 8, pp. 8917–8927, 2012.

H. Ghaffari, B. J. Ghassam, S. Chandra Nayaka, K. Ramachandra Kini, and H. S. Prakash, “Antioxidant and neuroprotective activities of Hyptis suaveolens (L.) Poit. against oxidative stress-induced neurotoxicity,” Cellular and Molecular Neurobiology, vol. 34, no. 3, pp. 323–331, 2014.

I. J. A. Moreira, M. P. N. Moreno, M. F. G. Fernandes et al., “Vasorelaxant effect of Hyptis fruticosa Salzm. ex Benth., Lamiaceae, dichloromethane extract on rat mesenteric artery,” Revista Brasileira de Farmacognosia, vol. 20, no. 5, pp. 762–766, 2010.
Evidence-Based Complementary and Alternative Medicine

Pacific Journal of Tropical Medicine, vol. 7, no. 1, pp. S421–S426, 2014.

[196] R. Alnamer, K. Alouei, E. H. Bouidida, A. Benjouad, and Y. Cherrah, “Sedative and hypnotic activities of the medicinal and aqueous extracts of Lavandula officinalis from Morocco,” Advances in Pharmacological Sciences, vol. 2012, Article ID 270824, pp. 1–5, 2012.

[197] H. Gopal, S. Vasanth, and S. V. Vasudevan, “Antimicrobial activity of essential oil of Leonotis nepetaphoea,” Ancient Science of Life, vol. 14, pp. 68–70, 1994.

[198] H. Parra-Delgado, G. G. Ruiz, A. N. Camacho, and M. Martinez-Vázquez, “Anti-inflammatory activity of some extracts and isolates from Leonotis nepetaphoea on TPA-induced edema model,” in Revista de la Sociedad Química de México, vol. 48, pp. 293–295, 2004.

[199] A. L. Cadena-González, M. Sörensen, and I. Theilade, “Use and valuation of native and introduced medicinal plant species in Campo Hermoso and Zetaquira, Boyacá, Colombia,” Journal of Ethnobiology and Ethnomedicine, vol. 9, no. 1, article no. 23, pp. 1–34, 2013.

[200] D. P. Müzzell, A. Lunardelli, C. E. Leite et al., “Nephroprotective and anti-inflammatory effects of aqueous extract of Melissa officinalis L. on acetonaminophen-induced and pleurisy-induced lesions in rats,” Brazilian Archives of Biology and Technology, vol. 56, no. 3, pp. 383–392, 2013.

[201] K. Fehú-Hemmelmann, F. Monsalve, and C. Rivera, “Melissa officinalis and Passiflora caerulea infusion as physiological stress decreaser,” International Journal of Clinical and Experimental Medicine, vol. 6, no. 6, pp. 444–451, 2013.

[202] L. Barros, M. Dueñas, M. I. Dias, M. J. Sousa, C. Santos-Buelga, and I. C. F. R. Ferreira, “Phenolic profiles of cultivated, in vitro cultured and commercial samples of Melissa officinalis L. infusions,” Food Chemistry, vol. 136, no. 1, pp. 1–8, 2013.

[203] N. C. de Carvalho, M. J. F. Corrêa-Angeloni, D. D. Leffa et al., “Evaluation of the genotoxic and antigenotoxic potential of Melissa officinalis in mice,” Genetics and Molecular Biology, vol. 34, no. 2, pp. 290–297, 2011.

[204] M. Bayat, A. A. Azami Tameh, M. H. Ghahremani et al., “Neuroprotective properties of Melissa officinalis after hypoxic-ischemic injury both in vitro and in vivo,” DARU Journal of Pharmaceutical Sciences, vol. 20, article 42, pp. 1–10, 2012.

[205] M. Johnson, E. G. Wesely, M. S. Kavitha, and V. Uma, “Antibacterial activity of leaves and inter-nodal callus extracts of Mentha arvensis L.,” Asian Pacific Journal of Tropical Medicine, vol. 4, no. 3, pp. 196–200, 2011.

[206] K. K. A. Santos, E. F. F. Matias, C. E. S. Souza et al., “Anti-Candida activity of Mentha arvensis and Turnera umbellata,” Journal of Medicinal Food, vol. 15, no. 3, pp. 322–324, 2012.

[207] S. M. Verma, H. Arora, and R. Dubey, “Antinflammatory and sedative hypnotic activity of the methanolic extract of the leaves of Mentha arvensis,” Ancient Science of Life, vol. 23, article 2, pp. 95–99, 2003.

[208] R. L. Londonkar and P. V. Poddar, “Studies on activity of various extracts of Mentha arvensis Linn against drug induced gastric ulcer in mammals,” World Journal of Gastrointestinal Oncology, vol. 1, no. 1, pp. 82–88, 2009.

[209] A. Stringaro, E. Vavala, and M. Colone, “Effects of Mentha suaveolens essential oil alone or in combination with other drugs in Candida albicans,” Evidence-Based Complementary and Alternative Medicine, vol. 2014, Article ID 125904, 9 pages, 2014.

[210] D. Pietrella, L. Angirolla, E. Vavala, A. Rachini, F. Mondello, and R. Ragni, “Beneficial effect of Mentha suaveolens essential oil in the treatment of vaginal candidiasis assessed by real-time monitoring of infection,” BMC Complementary and Alternative Medicine, vol. 11, article 8, 2011.

[211] V. López, S. Martín, M. P. Gómez-Serranillos, M. E. Carretero, A. K. Jäger, and M. I. Calvo, “Neuroprotective and neurochemical properties of mint extracts,” Phytotherapy Research, vol. 24, no. 6, pp. 869–874, 2010.

[212] H. Oumzi, S. Ghouami, and M. Rhajoui, “Antibacterial and antifungal activity of essential oils of Mentha suaveolens,” Phytotherapy Research, vol. 16, no. 8, pp. 727–731, 2002.

[213] M. C. Pereira, G. R. Vilela, L. M. Costa et al., “Inibição do desenvolvimento fúngico através da utilização de óleos essenciais de condimentos,” Ciência e Agrotecnologia, vol. 30, no. 4, pp. 731–738, 2006.

[214] C. d. Carretto, J. C. Junqueira, R. B. Almeida, M. R. Furlan, and A. O. Jorge, “Antimicrobial activity of Mentha piperita L. against Candida sp,” Brazilian Dental Science, vol. 13, no. 1, pp. 4–9, 2010.

[215] M. A. Maggiore, A. A. Albanese, L. B. Gende, M. I. Eguaras, G. M. Denegri, and M. C. Elissondo, “Antibacterial activity of Mentha spp. essential oils on Echinococcus granulosus protozoa and metacestodes,” Parasitology Research, vol. 110, no. 3, pp. 1103–1112, 2012.

[216] S. M. Barbalho, F. M. V. F. Machado, E. L. Guiger et al., “Espécies de Mentha podem auxiliar na redução de fatores de risco vascular em pacientes diabéticos,” Revista Saúde e Pesquisa, vol. 4, no. 3, pp. 387–392, 2011.

[217] D. Jain, N. Pathak, S. Khan et al., “Evaluation of cytotoxicity and anticarcinogenic potential of Mentha leaf extracts,” International Journal of Toxicology, vol. 30, no. 2, pp. 225–236, 2011.

[218] Y. A. Taher, “Antinoceptive activity of Mentha piperita leaf aqueous extract in mice,” Libyan Journal of Medicine, vol. 7, no. 1, pp. 1–5, 2012.

[219] M. Mahboubi and G. Haggi, “Antimicrobial activity and chemical composition of Mentha pulegium L. essential oil,” Journal of Ethnopharmacology, vol. 119, no. 2, pp. 325–327, 2008.

[220] P. Arumugam, N. G. Priya, M. Subatha, and A. Ramesh, “Anti-inflammatory activity of four solvent fractions of ethanol extract of Mentha spicata L. investigated on acute and chronic inflammation induced rats,” Environmental Toxicology and Pharmacology, vol. 26, no. 1, pp. 92–95, 2008.

[221] Z. Tayarani-Najarian, E. Talasaz-Firozzi, R. Nasiri, N. Jalali, and M. K. Hassanzadeh, “Antiemetic activity of volatile oil from Mentha spicata and Mentha × piperita in chemotherapy-induced nausea and vomiting,” ecmancermedicalsience, vol. 7, no. 1, article no. 290, pp. 1–6, 2013.

[222] T. A. Arruda, R. M. Antunes, R. M. Catão et al., “Preliminary study of the antimicrobial activity of Mentha × villosa Hudson essential oil, rotundifolione and its analogues,” Revista Brasileira de Farmacognosia, vol. 16, no. 3, pp. 307–311, 2006.

[223] A. V. L. Freitas, R. A. B. Azevedo, Y. B. Pereira, E. C. Freitas Neto, and M. F. B. Coelho, “Uses of medicinal plants in Rio Grande do Norte,” Journal of Global Biosciences, vol. 3, no. 4, pp. 749–762, 2014.

[224] J. S. Oliveira, L. A. Porto, C. S. Estevez et al., “Phytochemical screening and anticonvulsant potential of Ocimum basilicum leaf essential oil,” Boletín Latinoamericano y del Caribe de Plantas Medicinales y Aromáticas, vol. 8, no. 3, pp. 195–202, 2009.

[225] C. V. Nakamura, T. Ueda-Nakamura, E. Bando, A. F. Negrão Melo, D. A. Garcia Cortez, and B. P. Dias Filho Filho, “Antibacterial activity of Ocimum gratissimum L. essential oil,” Memórias do Instituto Oswaldo Cruz, vol. 94, no. 5, pp. 675–678, 1999.
[256] J. H. Doughari, “Antimicrobial activity of Tamarindus indica Linn,” *Tropical Journal of Pharmaceutical Research*, vol. 5, no. 2, pp. 597–603, 2006.

[257] A. H. Teixeira, M. M. Bezerra, H. V. Chaves, D. R. Val, S. M. P. Filho, and A. A. R. Silva, “Conhecimento popular sobre o uso de plantas medicinais no município de Sobral-Ceará, Brasil,” *Sanare*.

[258] M. D. Souza, R. R. Fernandes, and M. C. Pasa, “Estudo etnobotânico de plantas medicinais na comunidade São Gonçalo beira rio, Cuiabá, MT,” *Revista Biodiversidade*, vol. 9, no. 1, pp. 91–100, 2010.

[259] G. A. B. Canuto, A. A. O. Xavier, C. N. Leandro, and M. T. de Benassi, “Physical and chemical characterization of fruit pulps from Amazonia and their correlation to free radical scavenger activity,” *Revista Brasileira de Fruticultura*, vol. 32, no. 4, pp. 1196–1205, 2010.

[260] S. Khalid, W. M. Shaik Mossadeq, D. A. Israf et al., “In vivo analgesic effect of aqueous extract of tamarindus indica L. fruits,” *Medical Principles and Practice*, vol. 19, no. 4, pp. 255–259, 2010.

[261] A. A. Suralkaz, K. N. Rodge, R. D. Kamble, and K. S. Maske, “Evaluation of anti-inflammatory and analesic activities of Tamarindus indica seeds,” *International Journal of Pharmaceutical Sciences and Drug Research*, vol. 4, no. 3, pp. 213–217, 2012.

[262] P. M. Tayade, B. Jadhav, S. S. Angadi et al., “Anti-histaminic activity of methanolic extract of leaves of Tamarindus indica Linn,” *Journal of Chemical and Pharmaceutical Sciences*, vol. 2, no. 4, pp. 273–277, 2009.

[263] P. Kalra, S. Sharma, and S. K. Suman, “Antitumor effect of the methanolic extract of Tamarindus indica seeds in different experimental models,” *Journal of Pharmacy and Biomedical Sciences*, vol. 2, no. 3, pp. 236–241, 2011.

[264] G. Singi, D. Damasceno, E. D’Andréa, and G. Silva, “Efeitos agudos dos extratos hidroalcolicos do alho (Allium sativum L.) e do capim-limão (Cymbopogon citratus (DC.) Stapf) sobre a pressão arterial média de ratos anestesiados,” *Revista Brasileira de Farmacognosia*, vol. 15, no. 2, pp. 94–97, 2005.

[265] G. D. Almeida, E. P. Godoi, E. C. Santos, L. R. P. Lima, and M. E. Oliveira, “Extrato aquoso de Allium sativum potencializa a ação dos antibióticos vancomicina, gentamicina e tetraciclina frente Staphylococcus aureus,” *Revista de Ciências Farmacêuticas Básica e Aplicada*, vol. 34, no. 4, pp. 487–492, 2013.

[266] S. A. Tope, O. F. Sunday, and A. T. Gabriel, “Perfil antitumor de compostos de plantas medicinais em ratas wistar,” in *Dissertação - Mestrado em Ciências da Saúde*, Universidade de Brasília, 2013.

[267] J. Tortoriello, A. Herrera-Arellano, M. L. Herrera-Ruiz, G. Rojas-Bribiesca, A. Zamalpa, and V. Gonzáles, “PLO4 Aplicação clínica de um ansiolítico obtido de Galphimia glauca,” *Revista de Fitoterapia*, vol. 6, supplement 1, pp. 37–40, 2006.

[268] A. P. S. Pires, C. D. R. Oliveira, and M. Yonamine, “Ayahuasca: a review of pharmacological and toxicological aspects,” *Revista de Ciências Farmacêuticas Básica e Ampliada*, vol. 31, no. 1, pp. 15–23, 2010.

[269] L. S. G. D. Motta, “Toxicidade aguda, neurotoxicidade reprodutiva e embriotoxicidade do chá ayahuasca (Banisteris caapi e Psychotria viridis) em ratas wistar,” in *Dissertação - Mestrado em Ciências da Saúde*, Universidade de Brasília, 2013.

[270] J. A. C. Ribeiro, “A Cannabis e suas aplicações terapêuticas,” in *Dissertation*, Faculdade de Ciências da Saúde, Universidade Fernando Pessoa, Porto, Portugal, 2014.

[271] K. M. Honório, A. Arroio, and A. B. Silva, “Aspectos terapêuticos de compostos da planta Cannabis sativa,” *Quimica Nova*, vol. 29, no. 2, pp. 318–325, 2006.

[272] A. J. Hill, C. M. Williams, B. J. Whalley, and G. J. Stephens, “Phytocannabinoids as novel therapeutic agents in CNS disorders,” *Pharmacology & Therapeutics*, vol. 133, no. 1, pp. 79–97, 2012.

[273] A. W. Zuardi, J. A. S. Crippa, J. E. C. Hallak, F. A. Moreira, and F. S. Guimarães, “Cannabidiol, a Cannabis sativa constituent, as an antipsychotic drug,” *Brazilian Journal of Medical and Biological Research*, vol. 39, no. 4, pp. 421–429, 2006.

[274] J. F. Pedrazzi, A. C. Pereira, F. V. Gomes, and E. D. Bel, “Perfil antiinflamatório do canabidiol,” *Medicina*, vol. 47, no. 2, pp. 112–119, 2014.

[275] A. H. Teixeira, M. M. Bezerra, H. V. Chaves, D. R. Val, S. M. P. Filho, and A. A. R. Silva, “Atividades antimicrobiana e antioxidante e toxicidade aos corações criollos e indígenas en Corrientes, Argentina,” in *Memórias do Instituto Oswaldo Cruz*, vol. 86, supplement 2, pp. 203–205, 1991.

[276] R. O. Arise, S. O. Malomo, J. O. Adebayo, and A. Igumun, “Efeitos agudos de extrato de Eucalyptus globulus em lipídio peroxidation and selected enzymes of rat liver,” *Journal of Medicinal Plants Research*, vol. 3, no. 2, pp. 77–81, 2009.

[277] R. G. Bachir and M. Benali, “Antibacterial activity of the essential oil of the leaves of Eucalyptus globulus against Escherchia coli and Staphylococcus aureus,” *Asian Pacific Journal of Tropical Biomedicine*, vol. 2, no. 9, pp. 739–742, 2012.

[278] B. Damjanović-Vratnić, T. Đaković, D. Šuković, and J. Damjanović, “Antimicrobial effect of essential oil isolated from *Eucalyptus globulus* Labill. from Montenegro,” *Czech Journal of Food Sciences*, vol. 29, no. 3, pp. 277–284, 2011.

[279] E. O. Alves, J. H. Mota, T. S. Soares, M. C. Vieira, and C. B. Silva, “Levantamento etnobotânico e caracterização de plantas medicinais em fragmentos florestais de Dourados-MS,” *Ciência e Tecnologia*, vol. 32, no. 2, pp. 651–658, 2008.

[280] M. T. Auricchio, A. Bugno, S. B. M. Barros, and E. M. Bachici, “Atividades antimicrobiana e antioxidante e toxicidade de Eugenia uniflora,” *Latin American Journal of Pharmacy*, vol. 1, no. 26, pp. 78–81, 2006.

[281] B. N. Das and M. Ahmed, “Analgesic activity of fruit extract of *Averrhoa carambola*,” *International Journal of Life Sciences Biotechnology and Pharma Research*, vol. 1, no. 3, pp. 22–26, 2013.

[282] C. V. Romanini, M. W. Machado, M. W. Biavatti, and R. M. W. Oliveira, “Avaliação da atividade ansiolítica e antidepressiva do extrato fluido e fração aquosa de folhas de Passiflora alata Curtis em camundongos,” *Acta Scientiarum Health Sciences*, vol. 28, no. 2, pp. 159–164, 2006.

[283] A. Pironio, J. P. Coullier, H. A. Keller, and M. S. Ferrucci, “Influência de factores externos sobre La comercialización de plantas medicinales en un medio urbano: el caso de vendedores criollos e indígenas en Corrientes, Argentina,” *Boletín*.
**Evidence-Based Complementary and Alternative Medicine**

[287] C. Wolfman, H. Viola, A. Paladini, F. Dajas, and J. H. Medina, "Possible anxiolytic effects of chrysin, a central benzodiazepine receptor ligand isolated from *Passiflora coerulea*," *Pharmacology Biochemistry & Behavior*, vol. 47, no. 1, pp. 1–4, 1994.

[288] M. Coleta, M. T. Batista, M. G. Campos et al., "Neuropharmacological evaluation of the putative anxiolytic effects of Passiflora edulis Sims, its sub-fractions and flavonoid constituents," *Phytotherapy Research*, vol. 20, no. 12, pp. 1067–1073, 2006.

[289] A. S. Figueiredo and J. Modesto-Filho, "Efeito do uso da farinha desem gordura do Sesamum indicum L. nos níveis glicêmicos em diabéticos tipo 2," *Revista Brasileira de Farmacognosia*, vol. 18, no. 1, pp. 77–83, 2008.

[290] S. C. C. S. Pantojas, N. A. S. Sul, and N. N. N. Miguel, "Levantamento etnobotânico de Petiveria alliacea L. (phytolaccaceae) comercializadas no mercado de Madureira – RJ," *Revista Eletrônica Novo Enfoque*, vol. 17, no. 17, pp. 184–190, 2013.

[291] R. C. M. Guedes, N. G. P. Nogueira, A. M. F. Almeida, C. R. Souza, and W. P. Oliveira, "Atividade antimicrobiana de extratos brutos de Petiveria alliacea L.," *Latin American Journal of Pharmacy*, vol. 28, no. 4, pp. 520–524, 2009.

[292] Gomes B. P., "Avaliação dos efeitos centrais e atinociceptivos da matória e protetora gástrica do extrato hidroalcoólico bruto da Polygala paniculata L.," in *Phytomedicine*, vol. 10, no. 6, pp. 553–569, 2011.

[293] R. Kumar, V. Nair, Y. K. Gupta, and S. Singh, "Anti-inflammatory and anti-arithmetic activity of aqueous extract of Rosa centifolia in experimental models in rats," *International Journal of Rheumatic Diseases*, 2015.

[294] C. T. Selvan, S. Velavan, and M. C. J. Milton, "Antioxidant activity of Rosa centifolia flowers," *International Journal of Research in Plant Science*, vol. 4, no. 3, pp. 68–71, 2014.

[295] S. Chandragopal, S. Kumar, and B. Archana, "Evaluations of anti-ulcer activity of Rosa centifolia (Linn) flowers in experimental rats," *Journal of Natural Remedies*, vol. 12, no. 1, pp. 22–29, 2012.

[296] A. Ferreira, C. Proença, M. L. M. Serralheiro, and M. E. M. Araújo, "The *in vitro* screening for acetycholinesterase inhibition and antioxidant activity of medicinal plants from Portugal," *Journal of Ethnopharmacology*, vol. 108, no. 1, pp. 31–37, 2006.

[297] S. K. Andrade, "Avaliação das técnicas de extração e do potencial antioxidante dos extratos obtidos a partir de casca e de borra de café (Coffea arábica)," *Dissertação*, Universidade Federal de Santa Catarina, Programa de Pós-Graduação em Engenharia de Alimentos, 2011.

[298] Motta, "Luciana Soares Guerreiros da. Toxicidade aguda, neurotoxicidade reprodutiva e embriotóxicidade do chá ayahuasca (Banisteriopsis caapi e Psychotria viridis) em ratas wistar," *Dissertação*, Universidade de Brasília, 2013.

[299] V. L. Santos, V. B. M. Costa, M. F. Agra, B. A. Silva, and L. M. Batista, "Pharmacological studies of ethanolic extracts of Maytenus rigida Mart (Celastraceae) in animal models," *Revista Brasileira de Farmacognosia*, vol. 17, no. 3, pp. 336–342, 2007.

[300] R. Bertin, A. García-Argáez, M. Martínez-Vzquez, and G. Froldi, "Age-dependent vasorelaxation of Casimiroa edulis and Casimiroa pubescens extracts in rat caudal artery in vitro," *Journal of Ethnopharmacology*, vol. 137, no. 1, pp. 934–936, 2011.

[301] G. Froldi, R. Bertin, E. Secchi, G. Zagotto, M. Martínez-Vázquez, and A. García-Argáez, "Vasorelaxation by extracts of Casimiroa spp. in rat resistance vessels and pharmacological study of cellular mechanisms," *Journal of Ethnopharmacology*, vol. 134, no. 3, pp. 637–643, 2011.

[302] M. Molina-Hernández, N. P. Tellez-Alcántara, J. Pérez García, J. I. O. Lopez, and M. T. Jaramillo, "Anxiolytic-like actions of leaves of Casimiroa edulis (Rutaceae) in male Wistar rats," *Journal of Ethnopharmacology*, vol. 93, no. 1, pp. 93–98, 2004.

[303] S. Mora, G. Díaz-Veliz, H. Lungenstrass et al., "Central nervous system activity of the hydroalcoholic extract of Casimiroa edulis in rats and mice," *Journal of Ethnopharmacology*, vol. 97, no. 2, pp. 191–197, 2005.

[304] D. M. Arbo, "Avaliação toxicológica de *p*-sinefrina e extrato de Citrus aurantium L. (Rutaceae)," in *Dissertação*, Faculdade de Farmácia, Programa de Pós-Graduação em Ciências Farmacêuticas, UFRGS, 2008.

[305] C. A. R. A. Costa, T. C. Cury, B. O. Cassetti, R. K. Takahira, J. C. Flório, and M. Costa, "Citrus aurantium L. essential oil exhibits anxiolytic-like activity mediated by 5-HT1A-receptors and reduces cholesterol after repeated oral treatment," *BMC Complementary and Alternative Medicine*, vol. 13, no. 42, pp. 1–10, 2013.

[306] M. Akhlaghi, G. Shanamian, M. Rafieian-Kopaei, N. Parvin, M. Saadat, and M. Akhlaghi, "Flor de Citrus aurantium e ansiedade..."
glucoside isolated from Lantana camara L. (verbanaceae); Asian Pacific Journal of Tropical Medicine, vol. 6, no. 6, pp. 433–437, 2013.

[345] J. M. Barbosa-Filho, K. C. P. Medeiros, M. F. F. M. Diniz et al., "Natural products inhibitors of the enzyme acetylcholinesterase," Revista Brasileira de Farmacognosia, vol. 16, no. 2, pp. 258–285, 2006.

[346] M. A. Blanco, G. A. Colareda, C. Van Baren, A. L. Bandoni, J. Ringuelet, and A. E. Consolinii, "Antispasmodic effects and composition of the essential oils from two South American chemotypes of Lippia alba," Journal of Ethnopharmacology, vol. 149, no. 3, pp. 803–809, 2013.

[347] V. Y. Hatano, A. S. Torricelli, A. C. C. Giassi, L. A. Coslopi, F. F. Barcelos, M. L. Oliveira, N. P. B. Giovanini et al., "Estudo da atividade antioxidante e da atividade anticolinesterase do extrato hidroalcoólico da L. alba e do extrato hidroalcoólico de (R)-(−)-carvone", Brazilian Journal of Medical and Biological Research, vol. 45, no. 3, pp. 238–243, 2012.

[348] D. G. Sousa, S. D. G. Sousa, R. E. R. Silva et al., "Essential oil of Lippia alba and its main constituent citral block the excitability of rat sciatic nerves," Brazilian Journal of Medical and Biological Research, vol. 48, no. 6, pp. 697–702, 2015.

[349] V. C. N. Bitu, H. D. T. F. Fecundo, J. G. M. Costa et al., "Chemical composition of the essential oil of Lippia gracilis Schauer leaves and its potential as modulator of bacterial resistance," Natural Product Research (Formerly Natural Product Letters), vol. 28, no. 6, pp. 399–402, 2014.

[350] R. P. C. Ferraz, D. S. Bomfim, N. C. Carvalho et al., "Cytotoxic effect of leaf essential oil of Lippia gracilis Schauer (Verbanaceae); Phytotherapy, vol. 20, no. 7, pp. 615–621, 2013.

[351] K. R. Kiella, R. R. Marinho, J. S. Santos et al., "Anti-inflammatory and cicatrizing activities of thymol, a monoterpane of the essential oil from Lippia gracilis, in rodents," Journal of Ethnopharmacology, vol. 143, no. 2, pp. 656–663, 2012.

[352] S. L. Gerlach, R. Rathanakumar, G. Chakravarty et al., "Anticancer and chemosensitizing abilities of cycloviolacin O3 from Viola odorata and pyre cyclotides from Psychotria leptoptyrra; Peptide Science, vol. 94, no. 3, pp. 617–625, 2010.

[353] M. Akhbari, H. Batooli, and F. J. Kashi, "Composition of essential oil and biological activity of extracts of Viola odorata L. from central Iran," Natural Product Research (Formerly Natural Product Letters), vol. 26, no. 9, pp. 802–809, 2012.

[354] M. Zarrabi, R. Dalirfaradovuei, Z. Sephehrizade, and R. K. Kermanshahi, "Comparison of the antimicrobial effects of semipurified cyclotides from Iranian Viola odorata against some of plant and human pathogenic bacteria," Journal of Applied Microbiology, vol. 115, no. 2, pp. 367–375, 2013.

[355] H. S. Siddiqi, M. H. Mehmood, N. U. Rehman, and A. H. Gilani, "Studies on the antihypertensive and antidiyslipidemic activities of Viola odorata leaves extract; Lipids in Health and Disease, vol. II, no. 6, pp. 1–12, 2012.

[356] F. F. Barcelos, M. L. Oliveira, N. P. B. Giovaninni et al., "Estudo quimico e da atividade biologica cardiovascular do oleo essencial de folhas de Alpinia zerumbet (Pers.) B. L. Burrt & R. M. Sm. em ratos," Revista Brasileira de Plantas Medicinais, vol. 12, no. 1, pp. 48–56, 2010.

[357] F. A. Emiliiano, "Efeito vasodilatador do extrato hidroalcoólico da Alpinia zerumbet (Pers.) Burrt e Smith no leito vascular mesentérico;" in Dissertac¸˜ao, Departamento de Fisiopatologia Clínica e Experimental, Universidade Estadual do Rio de Janeiro, 2002.

[358] J. Chompoo, A. Upadhyay, M. Fukuta, and S. Tawata, "Effect of Alpinia zerumbet components on antioxidant and skin diseases-related enzymes," BMC Complementary and Alternative Medicine, vol. 12, no. 106, pp. 1–9, 2012.

[359] H. B. Beal, "Atividade antioxidante e identificação dos ácidos fenólicos do gengibre (Zingiber officinale Roscoe)," in Dissertaç¸˜ao, Centro de Ciências Agrárias, 2006.

[360] U. Bhandari, R. Kanojia, and K. K. Pillai, "Effect of ethanolic extract of Zingiber officinale on dyslipidaemia in diabetic rats," Journal of Ethnopharmacology, vol. 97, no. 2, pp. 227–230, 2005.

[361] J. F. T. Akochere, R. N. Ndip, E. B. Chenwi, L. M. Ndip, T. E. Njock, and D. N. Anong, "Antibacterial effect of Zingiber officinale and Garcinia kola on respiratory tract pathogens," East African Medical Journal, vol. 79, no. 11, pp. 588–592, 2002.

[362] P. Kamchouing, G. Y. M. Fandio, T. Dimo, and H. B. Jatsa, "Evaluation of androgenic activity of Zingiber officinale and Pentadiplandra brazzeana in male rats," Asian Journal of Andrology, vol. 4, no. 4, pp. 299–301, 2002.

[363] J. Sarris, "Herbal medicines in the treatment of psychiatric disorders: a systematic review; Phytotherapy Research, vol. 21, no. 8, pp. 703–716, 2007.

[364] J. Sarris, A. Panossian, I. Schweitzer, C. Stough, and A. Scholey, "Herbal medicine for depression, anxiety and insomnia: a review of psychopharmacology and clinical evidence," European Neuropsychopharmacology, vol. 21, no. 12, pp. 841–860, 2011.

[365] T. S. Anekonda and P. H. Reddy, "Can herbs provide a new generation of drugs for treating Alzheimer's disease?" Brain Research Reviews, vol. 50, no. 2, pp. 361–376, 2005.

[366] A. Dey, R. Bhattacharya, A. Mukherjee, and D. K. Pandey, "Natural products against Alzheimer's disease: Pharmacotherapeutics and biotechnological interventions," Biotherapy Advances, vol. 35, pp. 178–216, 2017.

[367] W. Mota, M. Barros, P. Cunha et al., "Avaliação da inibição da acetilcolinesterase por extratos de plantas medicinais," Revista Brasileira de Plantas Medicinais, vol. 14, no. 4, pp. 624–628, 2012.

[368] R. B. Carvalho, A. A. Almeida, R. M. Freitas et al., "Composição quimica e atividade anticolinesterásica de uma fração ativa do extrato de folhas de Citrus limon (L.) Burm; Quimica Nova, vol. 36, no. 9, pp. 1375–1379, 2013.

[369] M. T. S. Trevisan, F. V. V. Macedo, M. V. Meent, I. K. Rhee, and R. Verpoorte, "Seleção de plantas com atividade anticolinesterase para tratamento da doença de Alzheimer; Quimica Nova, vol. 26, no. 3, pp. 301–304, 2003.

[370] E. Rodrigues, B. Gianfratti, R. Tabach, G. Negri, and F. R. Mendes, "Preliminary investigation of the central nervous system effects of Tira-capeta (Removing the Devil), a cigarette used by some Quilombolas living in pantanal wetlands of Brazil; Phytotherapy Research, vol. 22, no. 9, pp. 1248–1255, 2008.

[371] M. Giorgetti, G. Negri, and E. Rodrigues, "Brazilian plants with possible action on the central nervous system-A study of historical sources from the 16th to 19th century; Journal of Ethnopharmacology, vol. 109, no. 2, pp. 338–347, 2007.

[372] R. D. Otsuka, J. H. G. Lago, L. Rossi, J. C. F. Galduródz, and E. Rodrigues, "Psychoactive plants described in a brazilian literary work and their chemical compounds," Central Nervous System Agents in Medicinal Chemistry, vol. 10, no. 3, pp. 218–237, 2010.

[373] S. Akhondzadeh and S. H. Abbasi, "Herbal medicine In the treatment of Alzheimer's disease; American Journal of Alzheimer's Disease & Other Dementias, vol. 21, no. 2, pp. 113–118, 2006.

[374] J. Barnes, "Cognitive Deficiency and dementia; The Pharmaceutical Journal, vol. 269, pp. 160–162, 2002.
[375] P. J. Houghton and M.-J. Howes, "Natural Products and Derivatives affecting Neurotransmission relevant to Alzheimer’s and Parkinson’s disease," *Neurosignals*, vol. 14, no. 1, pp. 6–22, 2005.

[376] M. Ekor, "The growing use of herbal medicines: issues relating to adverse reactions and challenges in monitoring safety," *Frontiers in Pharmacology*, vol. 4, pp. 1–10, 2014.

[377] D. P. Veloso, P. Guidini, R. M. Comério, and A. G. Silva, "Plantas utilizadas em fitomedicamentos pra os distúrbios do sono," *Natureza on Line*, vol. 6, no. 1, pp. 29–35, 2008.

[378] C. V. Romanini, M. W. Machado, M. W. Biavatti, and M. W. Rúbia, " Avaliação da atividade ansiolítica e antidepressiva do extrato fluido e fração aquosa de folhas de Passiflora alata Curtis em camundongos," *Acta Scientiarum Health Sciences*, vol. 26, no. 2, pp. 159–164, 2006.

[379] M. C. Pasa, J. J. Soares, and G. Guarim Neto, "Estudo etnobotânico na comunidade de Conceição-Açu (alto da bacia do rio Aricá Açu, MT, Brasil)," *Acta Botanica Brasilia*, vol. 19, no. 2, pp. 195–207, 2005.

[380] S. E. G. A. Vendrúscolo and L. Mentz, " Levantamento etnobotânicos de plantas utilizadas como medicinais por moradores do bairro Ponta Grossa, Porto Alegre, Rio Grande do Sul, Brasil," *Iheringia Série Botânica*, vol. 61, no. 1-2, pp. 83–103, 2006.

[381] C. S. P. Silva and C. E. B. Proença, " Uso e disponibilidade de recursos medicinais no município de Ouro Verde de Goiás, GO, Brasil," *Acta Botanica Brasilia*, vol. 22, no. 2, pp. 481–492, 2008.

[382] F. Leitão, V. S. Da Fonseca-Kruel, I. M. Silva, and F. Reinert, " Urban ethnobotany in Petrópolis and Nova Friburgo (Rio de Janeiro, Brazil)," *Revista Brasileira de Farmacognosia*, vol. 19, no. 1 B, pp. 333–342, 2009.

[383] M. C. Amorozo, " Uso e diversidade de plantas medicinais em Santo Antonio do Leverger, MT, Brasil," *Acta Botanica Brasilia*, vol. 16, no. 2, pp. 189–203, 2002.

[384] Z. V. Pereira, R. M. Mussury, A. B. de Almeida, and A. Sangalli, " Medicinal plants used by Ponta Porã community, Mato Grosso do Sul State," *Acta Scientiarum - Biological Sciences*, vol. 31, no. 3, pp. 293–299, 2009.

[385] A. R. Alves and M. J. Silva, " The use of phytotherapy in the care of children up to 5 years of age in urban and suburban areas of São Paulo city-Brazil," *Revista da Escola de Enfermagem da USP*, vol. 37, no. 4, pp. 85–91, 2003.

[386] T. Ceolin, R. M. Heck, R. L. Barbieri, E. Schwartz, R. M. Muniz, and C. N. Pillon, " Plantas medicinais: transmissão do conhecimento nas famílias de agricultores de base ecológica no Sul do RS," *Revista da Escola de Enfermagem da USP*, vol. 45, no. 1, pp. 47–54, 2011.