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Confrontation between ethnopharmacology and scientific results of the herbal medicaments from Brazil to be applied in primary health care

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Many studies on medicinal plants were conducted without botanical or pharmacological selection, in what produced little information to support the use of phytotherapic medicine in basic health units. The aim of this work was to generate data from important medicinal plants used by Brazilian population obtained from ethnopharmacological studies and indicate its correct use based on pharmacological test. It was demonstrated that a proportion higher than 60% of errors from ethnopharmacologic indications confronted against ratified pharmacological studies. From these data, the health professional could obtain scientific support to use phytotherapy in alternative medicine in basic health units.

Key words: Ethnopharmacology, pharmacobotany, phytotherapy, basic health unit.

INTRODUCTION

Actually, there is interest from industry and government in linking the technological advance and natural medicinal products based on popular knowledge, in order to develop a health care policy (França et al., 2008).
Concomitantly, the World Health Organization (WHO) has invested on programs to promote alternative therapies in order to meet the needs of the primary health care and supply the lack of products of pharmaceutical industry (Rates, 2001; França et al., 2008;).

Brazil has the greatest world's diversity of plant species (Medeiros and Cabral, 2001; Rates, 2001; Rodrigues and Carvalho, 2001; Resende and Cocco, 2002; Rodrigues and Carline, 2003a, b; Medeiros et al., 2004; Funari and Ferro, 2005; Malafaia et al., 2006; Souza and Felfile, 2006; Vendrusculo and Mentz, 2006; Maioli-Azevedo and Fonseca-Kruel, 2007; Alves et al., 2008; Miranda and Hanazaki, 2008), and in recent years, society has showed interest in the use of alternative and complementary therapies, especially based on the popular belief that "what is natural is harmless", and also for reasons of social and economic order, such as difficult access to industrial medicines and institutional health services (Rates, 2001; Oliveira and Gonçalves, 2006; Tomazzoni et al., 2006; França et al., 2008).

Other advantage of the use of alternative therapy is associated with the high prevalence of side effects from the use of industrial drugs (Rates, 2001; Maioli-Azevedo and Fonseca-Kruel, 2007).

However, medicines derived from phytotherapy and alternative therapies are marketed at fairs and popular

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drugstores without sanitary control (Rates, 2001; Coulaud-Cunha et al., 2004; Maioli-Azevedo and Fonseca-Kruel, 2007; França et al., 2008), prescription or botanical identification (Rates, 2001), and usually, phytotherapy products are marketed with supposed pharmacological activity; however, some of these drugs can be toxic and their action may not have been tested by pharmacological studies (Rates, 2001; Coulaud-Cunha et al., 2004; Oliveira and Gonçalves, 2006; Tomazzoni et al., 2006).

A common case in Brazil is the "espinheira-santa", which can be purchased in the informal market. However, the commercialized species is not *Maytenus ilicefolia* Mart but *Sorocea bomplandii* Bailon, the species most often used to falsify "espinheira-santa" (Coulaud-Cunha et al., 2004).

Much of ethnobotanical studies conducted in Brazil combine information from users of medicinal plants in several communities with botanical and/or pharmacological data from these populations. (Rodrigues and Carvalho, 2001; Alves and Silva, 2003; Rodrigues and Carlini, 2003a,b; Medeiros et al., 2004; Fenner et al., 2006; Silva et al, 2006; Souza and Felfile, 2006; Vila Verde et al., 2006; Vendruscolo and Mentz, 2006; Akerreta et al., 2007; Paixão, 2007; Miranda and Hanazaki, 2008; Jesus et al., 2009; Pereira et al., 2009).

Nevertheless, most of these studies were not aimed at assessing the dosage and use of medicinal herbs, and the use of these results for the community studied (Vendruscolo and Mentz, 2006). Therefore, this aspect is important, considering that the returning of knowledge to society can contribute to increase the understanding and valuation of the species under study (Patzlaff and Peixoto, 2009).

Many works have been conducted without selection of botanical or pharmacological criteria, which generates many descriptive data, but little data to support the use of herbal medicines in primary health care strategies (Resende and Cocco, 2002; Alves and Silva, 2003; Tomazzoni et al., 2006). Descriptive data play the role of preserving the traditional and cultural information opportunities for scientific research. However, other authors should verify the accuracy of this information by comparison of those data with specialized literature. Indeed, the aspects to be considered for the rational study of medicinal plants for drug development are the ethnomedical, ecological, chemotaxonomic, epidemiological, genomic and metabolic studies (Albuquerque and Hanazaki, 2006; Guirado and Cuellar, 2008).

Research on herbal medicines from the cultural source has a sense that must exceed the mere compilation (Albuquerque and Hanazaki, 2006).

What has been shown indicates an important advance in understanding the use of natural resources, because the public health system in Brazil and in other developing countries does not have an efficient pharmaceutical assistance program to supply the needs of drug to poor populations, a group that is at higher risk of becoming ill (Consendey et al., 2000),

Some cities in Brazil have implemented a program of herbal medicine use in primary health care in order to meet the needs of drugs in their communities (Resende and Cocco, 2002; Alves and Silva, 2003; Ogava et al., 2003; Michilis, 2004; França et al., 2008

Alternative therapies can offer and contribute to health sciences, and to enable individuals to have a relative autonomy in relation to the self-care (Rezende and Cocco, 2002),.

Alves and Silva (2003) reported that nurses have used alternative therapies such as the use of herbal medicine, justifying the lack of credibility in allopathic resources for the general population, also associated with the desire to facilitate the maintenance of the health of their patients, transforming these treatments more accessible to population of several socio-economic levels.

From the exposed facts given in the foregoing, it is possible to verify the fact that the use of herbal medicines in primary health care shows some difficulties, mainly due to the absence of indications of the use of these drugs based on adequate scientific studies, or because phytotherapy studies are more descriptive and do not verify whether these medicines have side effects.

Therefore, the purpose of this work was to provide data on the main plants used by Brazilian population described in ethnobothanical and/or ethnopharmacological studies indicating their adequate use, based on studies derived from biological and pharmacological tests.

MATERIAL AND METHODS

This is a bibliographic study, from the descriptive and comparative aspect. It was developed from the search of scientific papers available in the following data basis: LILACS, IBECS, MEDLINE, Library Cochrane, SciELO, Academic Google, from phytoterapy, farmacognosy, ethnopharmacology, ethnobotanic and biological tests indexers.

Generally, 32 studies were available by refinement method on the selection criteria that was to be published from 1994 to 2009. The other 72 papers were used because they contained biological or pharmacological assays on plants cited by the first papers previously studied.

The studied papers are divided into: 1) General subjects (Table 1); 2) Brazilian regions (Figure 1); 3) Rural, urban zone and others (Figure 2); 4) Use of medicinal plants in basic health units (Figure 3). Later, a table containing the medicinal plants that were confronted with the proven action by biological tests were constructed (Table 2).

Information on medicinal plants were obtained from the analysis of articles, which were used to elaborate tables and graphs of the location of these studies and the comparison of data obtained from communities with scientific data about the effects of these plants.

RESULTS

Papers on pharmacological data were used after the analysis of papers from Table 2; therefore, papers related on ethnobotany and/or ethnofarmacology shown in Table 1 were not computed in the calculus of percentage shown in the other figures.

Table 1. General issues addressed by ethnopharmacology and/or ethnobotanical papers.

General subject	Number of papers
Ethnobotany	21
Northern region	1
Midwestern region	9
Southern region	3
Southeastern region	6
Northeastern region	3
Return of knowledge to society	1
Brazilian biodiversity	1
Ethnobonical methods	3
Plants marketed on fairs and popular drugstores	3
Pharmacopeia	1
Use of medicinal plants in basic health units	2
Total	32

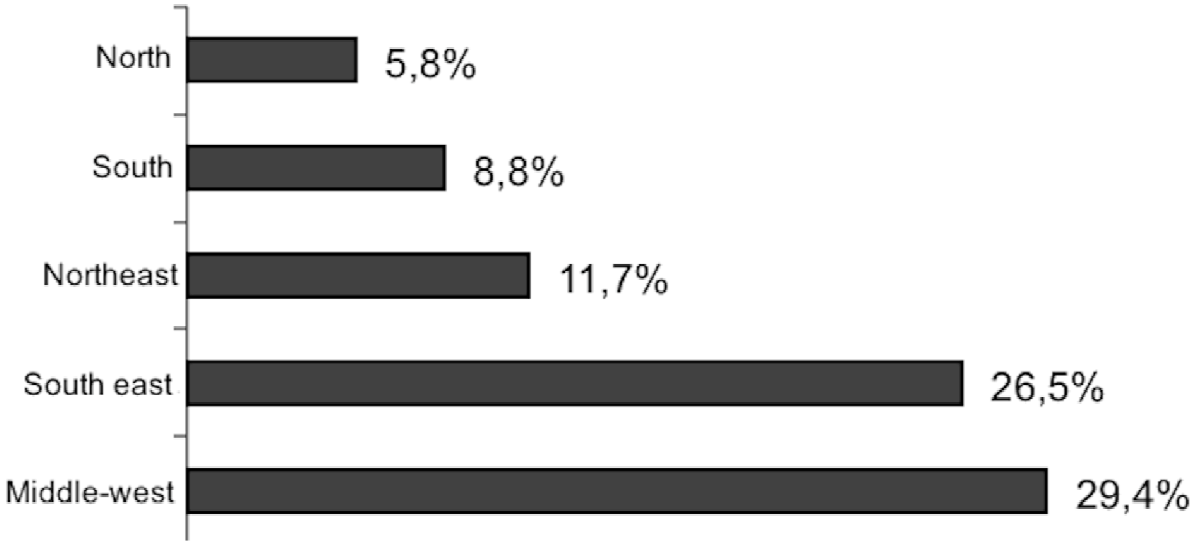

Figure 1. Percentage of papers from Brazilian regions where plants were cataloged.

DISCUSSION

The Brazilian region with the highest number of ethnobotanic studies is the mid-western region, followed by the southeastern region (Figure 1). No socio-cultural and economic relationship associated with the percentage of ethnobotanic studies confronted with poverty in these regions was found, because the poorest regions (northern and northwestern) (Brasil, 2007) are the regions with the smallest number of papers on these topics.

Although Rates (2001) and Tomazzoni and colleagues (2006) have reported that the use of medicinal plants is associated with low social and socio-economic levels and to the difficult access to medications (Garlet and Irgang, 2001; Maciel et al., 2002), data from this work have demonstrated that in the northern and northwestern regions, this is not occurring.

Therefore, the intensive use of phytoterapics in these regions may be out of the scope of the authors probably the use of phytotherapics is occurring, but it is not included in published studies. The mistakes of information obtained from populations about the effects of medical plants studied in this paper are 63.3%, and only 26.6% of data are in agreement with studies on the effects of these plants tested in laboratory (Table 2).

Important references are shown in Table 2, which is a fact that can generate problems to people's health, as in

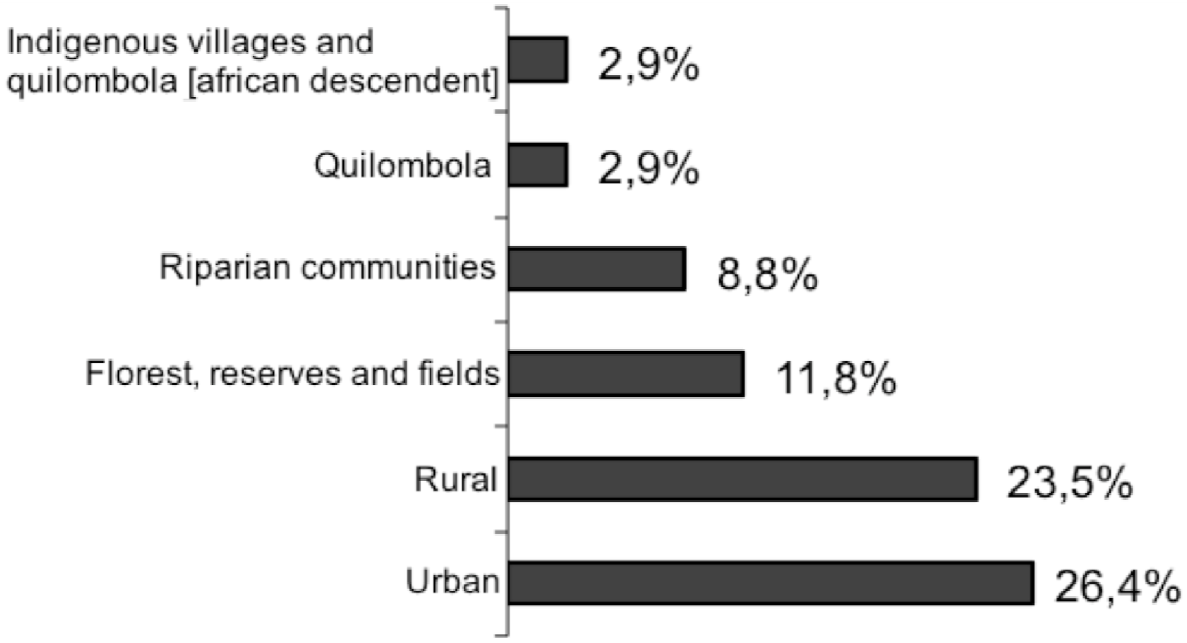

Figure 2. Percentage of population where plants were cataloged.

Figure 3. Percentage of use of medicinal plants in basic health units.

the case of *Symphytum officinale* L. (Confrey), which was found to be carcinogenic, but is it known by the population to have anti-inflammatory function (Mei et al., 2006); a fact was also verified for *Bidens pilosa* L. (Hairy), which shows genotoxic effects (Costa et al., 2008). The aim of most ethnobotanic studies, approximately 50%, was rural regions (indigenous village, quilombolas, riparian communities, forest, reserves and fields (Brazilian's savanna), and countryside with rural activities) (Figure 2). Therefore, the poor communities in these Brazilian regions are those with most subject to mistakes in the use of medicinal plants and these are the communities with the widest use of this type of therapy (Rates, 2001; Tomazzoni et al., 2006).

Approximately 92% of health units cited in the papers analyzed in this work do not use alternative therapies (Figure 3), therefore, the poor populations are not yet benefiting from the resources of phytotherapy, because the public health system in Brazil does not have a program of pharmaceutical assistance to supply the lack of medicines to these populations, which is the group at most risk of becoming ill.

It is evident that the implementation of phytotherapy programs in the primary health care to supply the lack of medicines, cited by many authors (Resende and Cocco, 2002; Alves and Silva, 2003; Ogava et al., 2003; Michilis, 2004; Tomazzoni et al., 2006; França et al., 2008), is a social and economic necessity; thus, health professionals

Table 2. Medicinal plants more cited on papers about ethnopharmacology and ethnobotany and their use confronted with data from papers with pharmacological tests.

Family/ scientific name/common name	Use mode/plant part	Medicinal effects cited by the studied population	Medicinal effects verified by biological tests in papers	Different
Acanthaceae				
Justicia pectoralis Jacq./Anador	Infusion / leaves	anti-inflammatory agent, against tooth pain	Analgesic and anti-inflammatory effects (Lino et al., 1998).	
Alliaceae				
Allium cepa L. /Scallion	Pass gums/bulb	Dental training	Anticonvulsant (Adesina, 1982); Antihipoglicemiante (Roman-Ramos et al., 1995)	Yes
Allium sativum L. / Garlic	Tea, maceration/bulb	Against cough, vermifuge and antiseptic	Cardiovascular and cancer prevention, stimulation of immunological system, reduction of cholesterol. Antiplatelet, hepatoprotective (Amagase et al., 2001); anticonvulsant (Adesina, 1982).	Yes
Aloaceae				
Aloe vera (L.) Burm/Aloe	Bath/ leaves	Hair fall, furuncle, dandruff,antiseptic.	Analgesic, anti-inflammatory, anticancer, antidiabetic, macrophage activation, antimicrobial effects on digestive tract and urinary infections, reduction of cholesterol and glucose (Holanda et al., 2009)	Yes
Aquifoliaceae				
Ilex paraguariensis St. Hill/Mate	Tea/ leaves	Soothing, anti CVA (cerebral vascular accident)	Antimicrobial (Biasi et al., 2009).	Yes
Asteraceae				
Achillea millefolium L. / Painkillers	Tea/ leaves	Actions antibiotic, healing, against headaches, ulcers, varicose, skin blemishes, fever, grippe, kidney stones	Against ulcers (Cavalcanti et al., 2006); stimulation of immunological system (Lopes et al., 2003); anticonvulsant (Athanassova et al., 1965).	
Achyrocline satureioides (Lam.) DC./Marcelinha	Tea/ leaves	"Good for stomach" and liver, hypotensive, tonic, slimming, diuretic, soothing, against colic, constipation, tooth pain, headache, uterine disturbs, spasm, antiseptic, heartburn , cholesterol, diarrhea, fever	Against liver cancer (Ruffa et al., 2002); soothing, analgesic, anti-inflammatory and antispasmodic (Oliveira et al., 2001).	
Ageratum conyzoides L. /Mentrasto	Infusion/root	Cough	Anti-inflammatory (Galati et al, 2001); antiulcerogenic (Mahmood et al., 2005)	Yes
Artemisia absinthium L. / Wormwood	Tea, maceration/ leaves	Hypotensive, grippe, against colic, indigestion, headache, stomach pain	Hallucinogen (Passos et al., 2009); anticonvulsant (Abdul-Ghani et al., 1987).	Yes
Artemisia vulgaris L. /Artemisia	Infusion / leaves	Soothing	Hallucinogen (Oliveira et al., 2001); Anticonvulsant (Passos et al, 2009)	Yes
Baccharis trimera DC. /Coot	Tea/ leaves	Against liver disorders, indigestion, ulcerations, wounds, cholesterol. Slimming	Against DM (Oliveira et al., 2005); oxidant (Oliveira et al, 2004); antiseptic (Avancini et al., 2000).	Yes
Bidens pilosa L. /Hairy	Tea/ all plant	Against hepatitis and ulcerations. Vermifuge, antibiotic, anti-inflammatory.	Genotoxic (Costa et al., 2008); antipyretic and anticancer (Sundararajan et al., 2006).	Yes

Table 2. Contd.

Lychnophora ericoides Less. /Arnica	Bath/ leaves, branch	Soothing, anti-inflammatory. Hematoma.	Analgesic (Borsato et al., 2000).	Yes
Matricaria chamomilla L. /Chamomile	Infusion / leaves	Soothing. Against insomnia, hypertension, dermatitis, wounds.	Against anxiety, insomnia, fatigue. Analgesic and anesthetic (Passos et al., 2009); Antioxidant and e antibacterial (Owlia et al., 2007); anticonvulsant (Athanassova et al., 1969).	
Mikania glomerata Spreng. /Guaco	Tea, syrup/ leaves	Cough, influenza, bronchitis	Anti-diarrheic antiophidic (Maiorano et al., 2005; Salgado et al., 2005).	Yes
Vernonia scorpioides (Lam.) Pers. / Benghalensis	Tea/ leaves	Cough	Anticancer and anti-inflammatory (Pagno et al., 2006).	Yes
Apiaceae				
Foeniculum vulgare Mill. /Fennel	Tea/ leaves	Colic, diuretic, antiseptic.	Antioxidant (Ruberto et al., 2000).	Yes
Petroselinum crispum (Mill.) Nyman/Salsa	Tea/ leaves/root	Soothing	Inhibitor of acetylcholinesterasis (Passos et al., 2009); subsidy the glucose and insulin metabolism (Broadhurst et al., 2000).	Yes
Pimpinella anisum L. /Erva doce	Tea/ leaves	Against colic and indigestion	Inhibitor of acetylcholinesterasis (Passos et al., 2009); subsidy the glucose and insulin metabolism (Broadhurst et al., 2000), anticonvulsant (Athanassova et al., 1969).	Yes
Boraginaceae				
Symphytum officinale L. /Confrey	Tea/ leaves	Anti-inflammatory, cough	Carcinogenic, hepatotoxic (Mei et al., 2006); anticonvulsant (Athanassova et al., 1969).	Yes
Brassicaceae				
Nasturtium officinale R.Br. /Waterclass	Tea/ leaves, stem	Against cold, bronchitis.	Cardioprotective; antioxidant (Yazdanparast et al., 2008).	Yes
Caprifoliaceae				
Sambucus australis Cham & Schltdl/Amravati	Tea/ leaves	Against cold	Not found	
Caryophyllaceae				
Dianthus caryophyllus L. / Harpsichord	Tea/ flower	Against influenza	Not found	
Chenopodiaceae				
Chenopodium ambrosioides L. /Herb of Santa Maria	Infusion / leaves	Vermifuge, antibiotic, antiseptic, expectorant. Against vaginal flux (vaginitis).	Antifungal; antioxidant (Kumar et al., 2007); anticancer (Ruffa et al., 2002).	Yes
Crassulaceae				
Cotyledon orbiculata L. /Balm	Maceration/ leaves	Soothing. Against indigestion and cancer.	Not found	

Table 2. Contd.

Euphorbiaceae				
Phyllanthus niruri L. / Shatterstone	Tea/ all plant	Diuretic and against renal disorders	Reduces urinary calcium based on the analysis of a subset of patients presenting hypercalciuria (Nishiura et al., 2004); Anticarcinogenic (Jeena et al, 1999).	
Equisetaceae				
Equisetum arvense L. /Horsetail	Tea/ leaves	Against renal disorders	Antioxidant – prevents degenerative diseases (Nagai et al., 2005). Hepatoprotective – treatment of hepatitis (Oh et al., 2004).	Yes
Fabaceae				
Acácia langsdorffii Benth. /Cat's craw	Tea/ leaves	Against urinary infections	Not found	
Bauhinia purpurea Wall /Pata-de-vaca	Infusion / leaves, flower, root	Against diabetes. Diuretic	Antioxidant (Braca et al., 2001).	Yes
Stryphnodendron adstringens (Mart.) Coville /Barbatimão	Tea/shell	Anti-inflammatory	Antimicrobial (Gomes et al., 2009); antinociceptive (Melo et al., 2007).	Yes
Lamiaceae				
Coleus barbatus Andr. /Boldo	Tea/ leaves	Against liver disorders, indigestion	Antioxidant (Falé et al., 2009); intestinal relaxant, antispasmodic (Câmara et al., 2003).	Yes
Lavandula officinalis Chaix & Kitt./Lavander	Tea/ all plant	Against indigestion. Soothing, carminative, anti-septic, balsamic, antispasmodic.	Against anxiety, insomnia, fatigue, analgesic, anesthetic (Passos et al., 2009).	
Mentha piperita L. /Mint	Tea/ leaves, flower	Vermifuge, tonic, antiseptic.	Antiallergic (Inoue et al., 2002); Anticonvulsant (Leslie, 1978).	Yes
Mentha pulegium L. / Pennyroyal	Tea/ leaves, flower	Soothing. Against influenza, catarrh. Subsidy the neural system.	Antimicrobial (Mahboubi and Haghi, 2008).	Yes
Ocimum gratissimum L. /Basil	Infusion /all plant	Antispasmodic, fungicide.	Antibacterial (Franco et al., 2007); antidiarrheal (Iwalokun et al., 2003), treatment of gastrointestinal disturbers (Madeira et al., 2002); Anticonvulsant (Nakamura et al., 1999; Amagase et al., 2001).	
Rosmarinus officinalis L. /Rosemary	Tea/ leaves	Tonic. Against wounds, dandruff, antimicrobial, baldness.	Inhibitor of acetylcholinesterasis (Passos et al., 2009); antioxidant (Gachkara et al., 2007; Wang et al., 2008); antimicrobial and antimutagenic (Marzouk et al., 2006); anticonvulsant (Passos et al., 2009).	
Lauraceae				

Table 2. Contd.

Cinnamomum zeylanicum Blume /Canela	Infusion / leaves, shell	Against influenza, body pain, leucorrhea, grippe, circulatory problems. Hypotensive, subsidy stomach problems.	Treatment of any hepatic diseases (Moselhy and Ali, 2009); improvement immunological activity (Niphade et al., 2009), anticancer (Ramesh et al., 2009); antifungic (Carmo et al., 2008); anticonvulsant (Sugaya et al., 1988).	Yes
Persea americana Mill. /Avocado	Tea/ leaves, core	Against renal disorders, dandruff, baldness, indigestion. Diminution of uric acid.	Antimicrobial (Gomes et al., 2009); diminution of cholesterol (Salgado et al., 2008).	
Malvaceae				
Gossypium barbadense L. /Cotton	Tea, juice / leaves, seed	Anti-inflammatory agent	Antibacterial (Cassano et al., 2009).	Yes
Passifloraceae				
Passiflora edulis Sims. /Passion fruit	Infusion / leaves, fruit	Blood soothing, depurative	Ansiolitic (Dhawan et al., 2001; Coleta et al., 2006).	Yes
Plantaginaceae				
Plantago major L. /Plantain	Tea, infusion / leaves, root	Against throat pain, wounds.	Protective against respiratory infections (Hetland et al., 2000); anti-inflammatory and analgesic (Guillén et al., 1997).	
Poaceae				
Cymbopogon citratus (DC.) Stapf. /Lemongrass	Infusion / leaves	Soothing, digestive, hypotensive. Against headache, grippe, cough and osteoporosis.	Antifungal (Souza et al., 2005); antibacterial (Pereira et al., 2004); anticonvulsant (Carlini et al., 1986).	Yes
Punicaceae				
Punica granatum L. / Pomegranate	Tea/fruit, shell	Against throat pain.	Antioxidant (Singh et al., 2002).	Yes
Rutaceae				
Ruta graveolens L. /Arruda	Infusion, maceration/ leaves	Against indigestion, hemorrhoid, mycosis. Vermifuge, enemagogue.	Antifungal (Oliva et al., 2003); inhibitor of acetylcholinesterasis (Passos et al., 2009).	Yes
Citrus limon (L.) Osbeck /Lemon	Juice, tea/leaves, fruit	Against influenza, cough, cold, bronchitis, cholesterol, headache, grippe. Slimming.	Antispasmodic, analgesic, local anesthetic (Ghelardini et al., 1999), antifungal (Souza et al., 2005).	Yes
Verbanaceae				
Lippia alba (Mill.) Blume /Erva cidreira	Infusion / leaves, flower	Sedative, soothing.	Antifungical (Souza et al., 2005); antiulcerogenic (Pascual et al., 2001); anticonvulsant (Barros Viana et al., 2000).	
Vitaceae				
Cissus simsiana Schult and Schult f. /Insulin plant	Tea/ leaves	Against diabetes.	Not found	
Zingiberaceae				
Curcuma longa L. /Saffron	Tea, maceration/root	Against throat pain.	Antibacterial (Franco et al., 2007).	Yes
Zingiber officinalis Rosc. /Ginger	Tea/ stem	Against influenza, indigestion, hemorrhage, nausea. Expectorant, antimicrobial	Antiulcerative and anticonvulsant effects (Sugaya et al., 1978); cytoprotective (Al-Yahya et al., 1989).	Yes

who work with poor populations should implement a program for the rational use of herbal medicines in these health units.

Besides, alternative therapies can contribute to people's health, because they allow relative autonomy in relation to the act of self-caring (Resende and Cocco, 2002), which is a fact common in areas distant from urban centers.

Alves and Silva (2003) emphasized that nurses have used alternative therapies to assist their patients, but this practice is rarely used by nursing professionals in health units. In the professional profile of nurses in Brazil, the Ministry of Education (MEC) indicates that these professionals should also develop, implement and participate in research and extension, and also in the implementation of the educational policy in favor of patients, therefore, making treatments feasible to population from various socioeconomic levels.

Health professionals can encourage the use of medicinal plants in different places, including in areas of poor health resources, because these professionals should act as advisers for the correct use of this alternative therapy (Rates et al., 2001; Resende and Cocco, 2002; França et al., 2008).

A compilation of therapeutic properties validated from pharmacological tests and the indication of the correct use of medicinal plants are shown in Table 2, from confronting the cultural with scientific data. It is necessary because etnobotany is a relatively new scientific class and, therefore with incipient epistemology, ancient in its practice but new in the use of scientific method. Finally, the findings obtained here respond to popular appeal of returning to populations that offer their knowledge (Patzlaff and Peixoto, 2009), but, in this case, it was confirmed or corrected by science.

Conclusion

From data obtained in this work, it could be concluded that: 1) the use of alternative therapies such as the use of phytotherapics in the primary health assistance is incipient; 2) information about the properties of phytotherapic medicines from medicinal plants show high percentage of divergence confronted with pharmacological tests; 3) nurses need to be pioneer in the use of phytotherapics in the primary health assistance and in the care process; 4) the use of phytotherapics in the primary health assistance can offer better conditions of life to needy populations; 5) there are fewer studies on plants considered medicinal which are conducted in the poorest regions of Brazil when compared to richer regions.

Based on the contents of the table that associates the use of medicinal plants by communities compared to data obtained by pharmacological tests, a proportion higher than 60% of errors was demonstrated; therefore, this kind of verification is necessary so that health professionals can obtain scientific support for the use of phytotherapics in basic health units.

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REFERENCES

Abdul-Ghani AS, El-Lati SG, Sacaan AI, Suleiman MS, Amin RM (1987). Anticonvulsant effects of some Arab medicinal plants. Int. J. Crude Drug Res., 25(1): 39-43.

Adesina SK (1982). Studies on some plants used as anticonvulsants in Amerindian and African traditional medicine. Fitoterapia, 53: 147-162.

Akerreta S, Cavero RY, Calvo MI (2007). First comprehensive contribuction to medical ethnobotany of Western Pyreness. J. Ethnobiol. Ethnomed., 3(26): 1-13.

Albuquerque UP, Hanazaki N (2006). Research ethno-directed the discovery of new drugs and medical interest: weaknesses and perspectives. Rev. Bras. Farmacogn., 16: 678-689.

Alves AR, Silva MJP (2003). 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. Rev. Esc. Enferm. USP, 37(4): 85-91.

Alves EO, Motta JH, Soares TS, Vieira MC, Silva CB (2008). Etnobotanical survey and medicinal plants characterization in forest fragments in Dourados-MS. Ciênc. Agrotec., 32(2): 651-658.

Al-Yahya MAA, Rafatullah AM, Mossa S, Parmar JS, Tariq NS (1989). Gastroprotective activity of ginger *Zingiber officinale* Rose, in Albino rats. Am. J. Chin. Med., 17(1-2): 51-56.

Amagase H, Petesch BL, Matsura H, Kasuga S, Itakura Y (2001). Intake of Garlic and Its Bioactive Components. J. Nutr., 131(3S): 955S-962S.

Athanassova S, Shopova S, Roussinov K (1965). Pharmacological studies of Bulgarian plants with a view to their anticonvulsive effect. Acad. Bulg. Sci., 18: 691-694.

Athanassova S, Shopova S, Roussinov K, Markova M (1969). Pharmacological studies of Bulgarian plants with a view to their anticonvulsive effect. Izv Inst. Fiziol. Bulg. Akad. Nauk., 12: 205-216.

Avancini CAM, Wiest JM, MundstocK E (2000). Bacteriostatic and bactericidal activity of the *Baccharis trimera* (Less.) D.C. - Compositae decocto, as disinfectant or antisseptic. Arq. Bras. Med. Vet. Zootec., 53(3): 230-234.

Barros VGS, Vale TGD, Silva CMM, Abreu Matos FJ (2000). Anticonvulsant activity of essential oils and active principles from chemotypes of *Lippia alba* (Mill.). Biol. Pharm. Bull., 23(11): 1314-1317.

Biasi B, Grazziotin NA, Hofmann Jr AE (2009). Antimicrobial activity of extracts of the leaves and branches of *Ilex paraguariensis* (erva-mate). Rev. Bras. Farmacogn., 19(2b): 582-585.

Borsato MLC, Grael CFF, Souza GEP; Lopes NP (2000). Analgesic activity of the lignans from *Lychnophora ericoides*. Phytochemistry, 55(7): 809-813.

Braca A, Tommasi ND, Bari LD, Pizza C, Politi M, Morelli I (2001). Antioxidant Principles from *Bauhinia tarapotensis*. J. Nat. Prod., 64(7): 892–895.

Brasil (2007). Instituto Brasileiro de Geografia e Estatística. Rede Interagencial de Informações para saúde (RIPSA). Indicadores socioeconômicos. Proporção de pobres (%) por ano segundo Região e Unidade da Federação. 2007. Disponível em:

<http://tabnet.datasus.gov.br/cgi/tabcgi.exe?idb2008/b05.def>. Acesso em: 06 mar. 2010.

Broadhurst CL, Polansky MM, Anderson RA (2000). Insulin-like Biological Activity of Culinary and Medicinal Plant Aqueous Extracts *in vitro*. J. Agric. Food Chem., 48(3): 849–852.

Câmara CC, Nascimento NRF, Macêdo-Filho CL, Almeida FBS, Fonteles MC (2003). Antispasmodic Effect of the Essential Oil of *Plectranthus barbatus* and some Major Constituents on the Guinea-Pig Ileum. Planta Med., 69(2): 1080-1085.

Carlini EA, Contar JDP, Silva-Filho AR, Silveira NGD, Frochtengarten ML, Bueno OFA (1986). Pharmacology of lemongrass (*Cymbopogon citratus* Starpf). I. Effects of teas prepared from the leaves on laboratory animals. J. Ethnopharmacol., 17: 37-64.

Carmo ES, Lima EO, Souza EL, Sousa FB (2008). Effect of *Cinnamomum zeylanicum* blume essential oil on the growth and morphogenesis of some potentially pathogenic aspergillus species. Braz. J. Microbiol., 39(1): 91-97.

Cassano R, Trombino S, Ferrarelli T, Muzzalupo R, Tavano L, Picci N (2009). Synthesis and antibacterial activity evaluation of a novel cotton fiber (*Gossypium barbadense*) ampicillin derivative. Carbohydr. Polym., 78(3): 639-641.

Cavalcanti AM, Baggio CH, Freitas CS, Rieck L, Sousa RS, Silva-Santos JE, Mesia-Vela S, Marques MC (2006). Safety and antiulcer efficacy studies of *Achillea millefolium* L. after chronic treatment in Wistar rats. J. Ethnopharmacol., 107(2): 277-284.

Coleta M, Batista MT, Campos MG, Carvalho R, Cotrim MD, Lima TC, Cunha AP (2006). Neuropharmacological evaluation of the putative anxiolytic effects of *Passiflora edulis* Sims, its sub-fractions and flavonoid constituents. Phytother. Res., 20(12): 1067-1073.

Coulaud-Cunha S, Oliveira RS, Waissmann W (2004). Sale free *Sorocea bomplandii* Bailon as Espinheira Santa in the city of Rio de Janeiro-RJ. Rev. Bras. Farmacogn., 14: 51-53.

Dhawan K, Kumar S, Sharma A (2001). Anti-anxiety studies on extracts of *Passiflora incarnata* Linneaus. J. Ethnopharmacol., 78(2-3): 165-170.

Falé PL, Borgesa C, Madeira PJA, Ascensão L, Araújo MEM, Florêncio MH, Serralheiro MLM (2009). Rosmarinic acid, scutellarein 4′-methyl ether 7-*O*-glucuronide and (16S)-coleon E are the main compounds responsible for the antiacetylcholinesterase and antioxidant activity in herbal tea of *Plectranthus barbatus* (“falso boldo”). Food Chem., 114(3): 798-805.

Fenner R, Betti AH, Mentz LA, Rates SM (2006). Plants with potencial antifungal activity employed in brazilian folk medicine. Rev. Bras. de Ciênc. Farmac., 42(3): 369-394.

França ISX, Souza JA, Baptista RS, Britto VRS (2008). Popular medicine: benefits and drawbacks of medicinal plants. Rev. Bras. Enferm., 61(2): 201-208.

Franco ALP, Oliveira TB, Ferri PH, Bara MTF, Paula JR (2007). Evaluation of the chemical composition and antibacterial activity of essential oils of *Aloysia gratissima (Gillies & Hook)* Tronc*., Ocimum gratissimum L. and Curcuma longa L.* Rev. Eletrônica de Farm., 4(2): 200-220.

Funari CS, Ferro V (2005). Ethical use of the brazilian biodiversity: necessity and opportunity. Rev. Bras. Farmacogn., 15(2): 178-182.

Gachkara L, Yadegaria D, Rezaeib MB, Taghizadehc M, Astanehc SA, Rasooli I (2007). Chemical and biological characteristics of *Cuminum cyminum* and *Rosmarinus officinalis* essential oils. Food Chem., 102(3): 898-904.

Galati EM, Miceli N, Taviano MF, Sanogo R, Raneri E (2001). Anti-inflammatory and antioxidant activity of *Ageratum conyzoides*. Pharm. Biol., 39(5): 336-339.

Garlet TMB, Irgang BE (2001). Medicinal plants used in folk medicine by rural women workers in Cruz Alta, Rio Grande do Sul, Brazil. Revista Bras. Plantas Med., 4:9-18.

Ghelardini C, Galeotti N, Salvatore G, Mazzanti G (1999). Local anaesthetic activity of the essential oil of *Lavandula angustifolia*. Planta Med., 65(8): 700-703.

Gomes RT, Santos VR, Oliveira RR, Cortés ME, Brandão MGL (2009). Susceptibility of oral pathogenic microorganisms to aqueous and ethanolic extracts of *Stryphnodendron adstringens* (barbatimão). Int. J. Dent., 8(1): 1-5.

Guillén MEN, Emim JAS, Souccar C, Lapa AJ (1997). Analgesic and anti-inflammatory activities of the aqueous extract of *Plantago major* L. Pharm. Biol., 35(2): 99-104.

Guirado OAA, Cuéllar AC (2008). Strategies for the selection of medicinal plants to be studied. Rev. Cubana del Plant Med., 13(3): ????. (provide page number).

Hetland G, Samuelsen AB, Lévik M, Paulsen BS, Aaberge AS, Groeng EC, Michaelsen TE (2000). Protective effect of *plantago major* l. pectin polysaccharide against systemic S*treptococcus pneumoniae* infection in mice. Scand. J. Immunol., 52(4): 348-355.

Holanda CMCX, Costa MB, Silva NCZ, Junior MFS, Barbosa VSA, Silva RP, Medeiros AC (2009). Effect of an extract of *Aloe vera* on the biodistribution of sodium pertechnetate ($Na^{99m}TcO_4$) in rats. Acta Cir. Bras., 24(5): 383-386.

Inoue T, Sugimoto Y, Masuda H, Kamei C (2002). Antiallergic effect of flavonoid glycosides obtained from *Mentha piperita* L. Biol. Pharm. Bull., 25(2): 256-259.

Iwalokun BA, Gbenle GO, Adewole TA, Smith SI, Kinsinde KA, Omonigbehin EO (2003). Effects of *Ocimum gratissimum* L. essential oil at subinhibitory concentrations on virulent and multidrug-resistant Shigella strains from Lagos, Nigeria. Apmis, 111(4): 477-482.

Jeena KJ, Joy KL, Kuttan R (1999). Effect of *Emblica officinalis*, *Phyllanthus amarus* and *Picrorrhiza kurroa* on *N*-nitrosodiethylamine induced hepatocarcinogenesis. Cancer Lett., 136(1): 11-16.

Jesus NZT, Lima JCS, Silva RM, Espinosa MM, Martins DTO (2009). Ethnobotanical survey of plants popularly used as anti-ulcer and anti-inflammatory in Pirizal, Nossa Senhora do Livramento, MT, Brazil. Rev. Bras. Farmacogn., 19(1a): 130-139.

Kumar R, Mishra AK, Dubey NK, Tripathi YB (2007). Evaluation of *Chenopodium ambrosioides* oil as a potential source of antifungal, antiaflatoxigenic and antioxidant activity. Int. J. Food Microbiol., 115(2): 159-164.

Leslie GB (1978). A pharmacometric evaluation of nine Bio-Strath herbal remedies. Medita, 8: 31-47.

Lino CS, Taveira ML, Viana GSB, Matos FJA (1998). Analgesic and antiinflammatory activities of *Justicia pectoralis* Jacq and its main constituents: coumarin and umbelliferone. Phytother. Res., 11(3): 211-215.

Lopes FCM, Placeres MP, Moreira RRD, Santos L, Carlos IZ (2003). Avaliação da atividade imunológica *Achillea millefolium* L. ("mil-folhas"). Rev. Bras. Farmacogn., 13(2): 11-13.

Maciel MAM, Pinto AC, Jr. VFV, Grynberg NF, Echevarria A (2002). Medicinal plants: the need for multidisciplinary scientific studies. Quím. Nova, 25(3): 429-38.

Madeira SVF, Matos FJA, Leal-Cardoso JA, Criddle DN (2002). Relaxant effects of the essential oil of *Ocimum gratissimum* on isolated ileum of the guinea pig. J. Ethnopharmacol., 81(1): 1-4.

Mahboubi M, Haghi G (2008). Antimicrobial activity and chemical composition of *Mentha pulegium* L. essential oil. J. Ethnopharmacol., 119(2): 325-327.

Mahmood AA, Sidik K, Salmah I, Suzainur KAR, Philip K (2005). Antiucerogenic activity of *ageratum conyzoides* leaf extract against ethanol-induced gastric ulcer in rats as animal model. Int. J. Mole. Med. Adv. Sci., 1(4): 402-405.

Maioli-Azevedo V, Fonseca-kruel VS (2007). Medicinal and ritual plants sold in street markets of Rio de Janeiro, RJ, Brazil: a case study in the North and South zones. Acta Bot. Bras., 21(2): 263-275.

Maiorano VA, Marcussi S, Daher MAF, Oliveira CZ, Couto LB, Gomes OA, França SC, Soares AM, Pereira OS (2005). Antiophidian properties of the aqueous extract of *Mikania glomerata*. J. Ethnopharmacol., 102(3): 364-370.

Malafaia O, Campos AC, Torres O, Goldenberg S (2006). The herbal drugs and their potential healing in surgery. Acta Circ. Bras., 21(3): 1-1.

Marzouk Z, Mansour HB, Chraief I, Mosrati R, Cheriaa J, Neffati A, Marzouk B, Sfari M, Boukef K, Barillies D, Chekir Ghedira L (2006). Chemical composition, antibacterial and antimutagenic activities of four populations of *Rosmarinus officinalis* L. oils from Tunisia. J. Food Agric. Environ., 4(2): 89-94.

Medeiros LCM, Cabral IE (2001). The care with medicinal plants: a modality of childcare for mothers and nurse educator. Rev. Latino-Am. Enferm., 9(1): 18-26.

Medeiros MFT, Fonseca VS, Andreata RHP (2004). Medicinal plants

and its uses by the ranchers from the Rio das Pedras Reserve, Mangaratiba, RJ, Brazil). Acta Bot. Bras., 18(2): 391-399.
Mei N, Guo L, Zhang L, Shi L, Sun YA, Fung C (2006). Analysis of gene expression changes in relation to toxicity and tumorigenesis in the livers of Big Blue transgenic rats fed comfrey (*Symphytum officinale*). BMC Bioinforma., 7(2): S16.
Melo JO, Endo TH, Bersani-amado LE, Svidzinski AE, Baroni S, Mello JCP, Bersani-Amado CA (2007). Effect of *Stryphnodendron adstringens* (barbatimão) bark on animal models of nociception. Rev. Bras. Ciênc. Farm., 43(3): 465-469.
Michilis E (2004). Situational diagnosis of herbal medicine services in the State of Rio de Janeiro. Rev. Bras. Farmacogn., 14(0): 16-19.
Miranda TM, Hanazaki N (2008). Knowledge and use of coastal sand-dune plant resources by communities from Cardoso (São Paulo) and Santa Catarina (Santa Catarina) islands, Brazil. Acta Bot. Bras., 22(1): 203-215.
Moselhy SS, Ali HKH (2009). Hepatoprotective effect of *Cinnamon* extracts against carbon tetrachloride induced oxidative stress and liver injury in rats. Biol. Res., 42(1): 93-98.
Nagai T, Myoda T, Nagashima T (2005). Antioxidative activities of water extract and ethanol extract from field horsetail (tsukushi) *Equisetum arvense* L. Food Chem., 91(3): 389-394.
Nakamura CV, Ueda-Nakamura T, Bando E, Melo AFN, Cortez DAG, Dias Filho BP (1999). Antibacterial Activity of *Ocimum gratissimum* L. Essential Oil. Mem. Inst. Oswaldo Cruz, 94(5): 675-678.
Niphade SR, Asad M, Chandrakala GK, Toppo E, Deshmukh P (2009). Imunomodulatory activity of *Cinnamomum zeylanicum* bark. Pharm. Biol., 47(12): 1168-1173.
Nishiura JL, Campos AH, Boim MA, Heilberg IP, Schor N (2004). *Phyllanthus niruri* normalizes elevated urinary calcium levels in calcium stone forming (CSF) patients. Urol. Res., 32(5): 362-366.
Ogava SEN, Pinto MTC, Kikuchi T, Menegueti VAF, Martins DBC, Coelho SAD Marques MJNJ, Virmond JCS, Monteschio P, D'Aquino M, Marques LC (2003). Implementation of the program of herbal medicine "Green Life" on the secretary of health of the Maringá (2000-2003). Rev. Bras. Farmacogn., 13: 58-62.
Oh H, Kim D, ChO J, Kim Y (2004). Hepatoprotective and free radical scavenging activities of phenolic petrosins and flavonoids isolated from *Equisetum arvense*. J. Ethnopharmacol., 95 (2-3): 421-424.
Oliva A, Meepagala KM, Wedge DE, Harries D, Hale AL, Aliotta G, Duke SO (2003) Natural fungicides from *Ruta graveolens* L. leaves, including a new quinolone alkaloid. J. Agric. Food Chem., 51(4): 890–896.
Oliveira ACP, Endringer DC, Amorim LAS, Brandão MGL, Coelho MM (2005). Effect of the extracts and fractions of *Baccharis trimera* and *Syzygium cumini* on glycaemia of diabetic and non-diabetic mice. J. Ethnopharmacol., 102(3): 465-469.
Oliveira AL, Padilha CD, Gonzales Ortega G, Petrovick RP (2001). *Achyrocline satureioides* (Lam.) DC., Asteraceae: comparative evaluation of the vegetal drug and preliminary optimization studies on extraction. Cad. de Farm., 17(1): 33-38.
Oliveira FQ, Gonçalves LA (2006). Knowledge on medicinal plants and phythomedicines and potential of toxicity by users from Belo Horizonte, Minas Gerais. Rev. Eletrônica de Famácia, 3(2): 36-41.
Oliveira SK, Dal-Pizzol F, Moreira JCF, Schenkel EP, Gosmann G (2004). Antioxidant activity of *Baccharis spicata*, *Baccharis trimera* and *Baccharis usterii*. Acta Farm. Bonaerense, 23(3): 365-364.
Owlia P, Rassoli I, Saderi H (2007). Antistreptcoccal and Antioxidant Activity of Essential Oil from *Matricaria chamomilla* L. Res. J. Biol. Sci., 2(2): 155-160.
Pagno T, Blind LZ, Biavatti MV, Kreuger MRO (2006). Cytotoxic activity of the dichloromethane fraction from *Vernonia scorpioides* (Lam.) Pers. (Asteraceae) against Ehrlich's tumor cells in mice. Braz. J, Med. Biol. Res., 39(11): 1483-1491.
Paixão NVA (2007). Ethnobotanical aspects of community ribeirinha River of São José, in district of Cameta – Para, Brazil. Rev. Bras. Agroecol., 2(2): 555-558.
Pascual ME, Slowing K, Carretero ME, Villa A (2001). Antiulcerogenic activity of *Lippia alba* (Mill.) N. E. Brown (Verbenaceae). Farmacology, 56(5-7): 501-504.
Passos CS, Arbo MD, Rates SMK, Poser GLV (2009). Terpenoids with activity in the Central Nervous System (CNS). Rev. Bras. Farmacogn., 19(1a): 140-149.
Patzlaff RG, Peixoto AL (2009). Research in ethnobotany and the return of systematized knowledge to the community: a complex issue. Hist. Cienc. Saúde-Manguinhos, 16(1): 237-246.
Pereira RS, Sumita TC, Furlan MR, Jorge AOC, Ueno M (2004). Antibacterial activity of essential oils on microorganisms isolated from urinary tract infection. Rev. Saúde Pública, 38(2): 326-328.
Pereira ZV, Mussury RM, Almeida AB, Sangalli A (2009). Medicinal plants used by Ponta Porã community, Mato Grosso do Sul State. Acta Sci. Biol. Sci., 31(3): 393-399.
Ramesh S, Jayant KS, Purba P; Suhit G, Anant R. P; Ruchika K (2009). Comparative analysis of cytotoxic effect of aqueous cinnamon extract from *Cinnamomum zeylanicum* bark with commercial cinnamaldehyde on various cell lines. Pharm. Biol., 47(12): 1174-1179.
Rates SMK (2001). Promoting the rational use of herbal medicines: an approach to teaching pharmacognosy. Rev. Bras. Farmacogn., 11(2): 57-69.
Resende HA, Cocco MIM (2002). The phytoterapy utilization in the rural population routine. 36(3): 282-288.
Rodrigues E, Carlini EA (2003a). Ethnopharmacological survey conducted among a group of Maroons in Brazil. Arq. Bras. de Fitom. Cient., 1(2): 80-87.
Rodrigues E, Carlini EA (2003b). Possible effects on the Central Nervous System of plants used by two Brazilian cultures (Maroons and Indians). Arq. Bras. de Fitom. Cient., 11(3): 147-154.
Rodrigues VES, Carvalho DA (2001). Etnobotanical survey of medicinal plants in the dominion of meadows in the region of the Alto Rio Grande - Minas Gerais. Rev. Ciênc. Agrotec. Lavras, 25(1): 102-123.
Roman-Ramos R, Flores-Saenz JL, Alarcon-Aguilar FJ (1995). Anti-hyperglycemic effect of some edible plants. J. Ethnopharmacol., 48(1): 25-32.
Ruberto G, Baratta MT, Deans SG, Dorman HJD (2000). Antioxidant and antimicrobial activity of *Foeniculum vulgare* and *Crithmum maritimum* essential oils. Planta Med., 66(8): 687-693.
Ruffa MJ, Ferraro G, Wagner ML, Calcagno ML, Campos RH, Cavallaro L (2002). Cytotoxic effect of Argentine medicinal plant extracts on human hepatocellular carcinoma cell line. J. Ethnopharmacol., 79(3): 335-339.
Salgado HRN, Roncari AFF, Moreira RRD (2005). Antidiarrhoeal effects of *Mikania glomerata* Spreng. (Asteraceae) leaf extract in mice. Rev. Bras. Farmacogn., 15(3): 205-208.
Salgado JM, Bin C, Mansi DM, Souza A (2008). Effect of the hass avocado (American Persea Mill) on hipercolesterolemic rats. Ciênc. Tecnol. Aliment, 28(4): 922-928.
Silva MIG, Godim APS, Nunes IFS, Souza FCF (2006). The use of herbal medicines in the family health care units in Maracanaú (CE). Rev. Bras. Farmacogn., 16(4): 455-462.
Singh RP, Murthy KNC, Jayaprakasha GK (2002). Studies on the antioxidant activity of pomegranate (*Punica granatum*) peel and seed extracts using *in vitro* models. J. Agric. Food Chem., 50(1): 81-86.
Souza CD, Felfile JN (2006). The utilization of medicinal plants in the region of Alto Paraíso of Goiás, GO, Brazil. Acta Bot. Bras., 20(1): 135-142.
Souza EL, Lima EO, Freire KRL, Sousa CP (2005). Inhibitory action of some essential oils and phytochemicals on the growth of various moulds isolated from foods. Braz. Arch. Biol. Technol., 48(2): 245-250.
Sugaya A, Tsuda T, Sugaya E, Takato M, Takamura K (1978). Effects of chinese medicine Saiko-Keishi-To on the abnormal bursting activity of snail neurons. Planta Med., 34(3): 294-298.
Sugaya E, Ishige A, Sekiguchi K, Iizuka S, Ito K, Sugimoto A, Aburada M, Hosoya E (1988). Inhibitory effect of TJ-960 (SK) on pentylenetetrazole-induced EEG power spectrum changes. Epil. Res., 2(1): 27-31.
Sundararajan P, Dey A, Smith A, Doss AG, Rajappan M, Natarajan S (2006). Studies of anticancer and antipyretic activity of *Bidens pilosa* whole plant. Afr. Health Sci., 6(1): 27-30.
Tomazzoni MI, Negrelle RRB, Centa ML (2006). Popular phytotherapy: the instrumental search as therapy Text Context Nursing, 15(1): 115-121.
Vendruscolo GS, Mentz LA (2006). Ethnobotanical survey of the

medicinal plants used by the community of Ponta Grossa neighborhood, Porto Alegre, Rio Grande do Sul, Brazil. Iheringia Sér. Bot., 61(1-2): 83-103.
Vila VGM, Paula JR, Carneiro DM (2006). Ethnobotanical survey of medicinal plants of the savannah used by the population of Mossâmedes (GO). Rev. Bras. Farmacogn., 13(1): 64-66.
Wang W, Wu N, Zu YZ, Fu YJ (2008). Antioxidative activity of *Rosmarinus officinalis* L. essential oil compared to its main components. Food Chem., 108(3): 1019-1022.
Yazdanparast R, Bahramikia S, Ardestani A (2008). *Nasturtium officinale* reduces oxidative stress and enhances antioxidant capacity in hypercholesterolaemic rats. Chem-Biol. Interact., 172(3): 176-184.