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Artigo

Local knowledge on medicinal plant gardens in a rural community near the Atlantic Rain Forest, southeastern Brazil

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RESUMO: "Conhecimento local em horta medicinal numa comunidade rural adjacente à Floresta Atlântica no sudeste do Brasil". O presente estudo objetivou identificar as plantas medicinais cultivadas em uma horta medicinal, situada no município de Casimiro de Abreu, Rio de Janeiro, Brasil, e diagnosticar o acesso à sua utilização e importância para a população local, baseando-se em entrevistas com o administrador da horta, e quarenta usuários da comunidade. O índice de importância relativa (IR) foi calculado para 96 espécies medicinais e, neste, observou-se que 27 espécies tiveram um RI≥1,00, com *Aloe vera* (L.) Burm. f. e *Leonurus sibiricus* L. (erva-macaé), atingindo o valor máximo (2,00). As entrevistas revelaram que a maioria dos usuários, residentes nas áreas rurais do município em que a horta está localizada, visitam-na com uma frequência semanal, depositando confiança no reconhecimento da planta e recomendações de uso do administrador, e sabem, em sua maioria, como preparar os remédios utilizados. As espécies que tratam afecções relacionadas ao sistema respiratório são as mais procuradas. O uso livre da horta pela comunidade local, associado com o pequeno investimento inicial, demonstra a viabilidade da iniciativa pública e do valor do conhecimento tradicional, mas também chama a atenção das autoridades para o uso humano de forma segura.

Unitermos: Horta de plantas medicinais, plantas medicinais, conhecimento local, comunidades rurais; etnobotânica.

ABSTRACT: The present study sought to identify the medicinal plants cultivated in a communal medicinal plant garden in Casimiro de Abreu, Rio de Janeiro State, Brazil, and to access its utilization and importance to the local population based on interviews with the garden's administrator and forty rural users. The Relative Importance Index (RI) was calculated for 96 medicinal species. Twenty-seven species had a RI≥1.00, with *Aloe vera* (L.) Burm. f. and *Leonurus sibiricus* L. (erva-macaé), having the largest value (2.00). Interviews revealed that the majority of the rural users live in the municipality where the garden is located, visit it on a weekly basis, trust the recommendations of the administrator, and know how to prepare the remedies used. Plants that treat illnesses related to the respiratory system are most sought after. The free use of the garden by the local community, associated with the small initial investment, demonstrates the viability of this public initiative and the value of traditional knowledge, but also calls the authorities attention for their safe human use.

Keywords: Medicinal plant garden, medicinal plants, local knowledge, rural communities, ethnobotany.

INTRODUCTION

Plants have been utilized in Brazilian popular medicine since ancient times, but nowadays it has been happening due to the difficulties encountered, especially by rural communities, in accessing primary healthcare services and to the prices of industrialized medicines. The acceptance and use of plants as an alternate therapeutic treatment is supported by the objectives of the World Health Organization in its programs to extend health programs throughout the world. The WHO officially recognized the use of phyto-therapeutic medications in 1978, and recommended the diffusion, on a world level, of information concerning their use (Ministério da Saúde, 2006).

Numerous Brazilian research institutes and universities have already taken steps to help preserve traditional knowledge of medicinal plants (e.g. Holetz et al., 2002; Pepato et al., 2002; Souza et al., 2004; Turino

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et al., 2004; Almeida et al., 2005; Melo et al., 2007), and numerous ethnobotanical studies have been undertaken, such as Almeida & Albuquerque (2002), Albuquerque & Andrade (1998), Albuquerque & Hanazaki (2006), in northeastern Brazil; Amorozo (2002), Guarim-Neto & Morais (2003), Borba & Macedo (2006), in the central-western region; Amorozo & Gély (1988), Guillaumet et al., (1990), Martins et al., (2005), in the north region; Marchese et al., (2004), Vendruscolo & Mentz (2006), in south region and Parente & Rosa (2001), Begossi et al., (2002), Christo et al., (2006), Azevedo & Silva (2006), Maioli-Azevedo & Fonseca-Kruel (2007) in the southeastern region.

In 2006, the Brazilian Health Ministry approved a National policy for Medicinal Plants and Phyto-therapeutic Medications that included provisions for proactive measures to improve public health by promoting the security, efficiency and quality of these herbal medications and phytmedicines, including the rescue of traditional knowledge (Ministério da Saúde, 2006). Ibargen (1997) has pointed out the importance of the herbalist's knowledge of medicinal plants, especially in low-income communities where the people have little access to health services. However, nowadays it is usual that the members of the community that possess great knowledge of the medicinal plants may not openly share it with the general community in order to garner power and respect.

The principal objectives of the present work were to: identify the medicinal plants grown in the communal municipal garden in Casimiro de Abreu, Rio de Janeiro, Brazil; determine their use-frequency; their importance o the visiting population; and support efforts to preserve local knowledge of useful plants in communities that border on national conservation areas.

METHODS

Study area

The municipality of Casimiro de Abreu (22°28'50"S, 42°12'15"W) is located along the Atlantic coast in Rio de Janeiro State, Brazil, 120 km far from Rio de Janeiro city. The municipality borders on the Poço das Antas Biological Reserve that protects one of the last remnants of Atlantic coastal forest in the region. The municipal population is approximately 22,000 inhabitants, and the regional economy is based on tourism, local commerce, cattle, and farming (IBGE, 2008).

Methodology

Research was undertaken between 9/2002 and 4/2003. Information concerning the medicinal plants was obtained through either open or semi-structured interviews (Alexiades, 1996) with the administrator of the medicinal garden, and plant samples were taken at those times for identification and later deposited at the Herbarium of the Rio de Janeiro Botanical Garden (RB).

The Relative Importance (RI) index was calculated for each medicinal plant examined according to Bennett & Prance (2000), based on the number of corporal systems indicated and the number of properties of the plants reported by the garden's administrator, using the formula: RI = (NCSS/NSCVS) + (NPS/NPVS), where: NCSS = number of corporal systems treated by a given species; NSCVS = total number of corporal systems treated by the most versatile species, NPS = total number of properties attributed to a given species; NPVS = total number of properties attributed to the most versatile species.

The illnesses treated by the plants were categorized according to an adaptation of the World Health Organization (WHO) classification, according to Almeida & Albuquerque (2002). The sixteen resultant categories are: a) infectious and parasitic diseases; b) neoplasms; c) illness of the endocrine glands, nutrition, and metabolism; d) blood diseases and those of the hemopoetic organs; e) illnesses of the sense organs (hearing); f) illnesses of the sense organs (eyes); g) illnesses of the nervous system; h) illnesses of the circulatory system; i) illnesses of the respiratory system; j) illnesses of the digestive system; k) illnesses of the genital-urinary system; l) illnesses of the skin and subcutaneous tissue; m) illnesses of the osteo-muscular system and connective tissues; n) afflictions and indefinite pain; o) viral infections; p) cerebral vascular afflictions.

In order to evaluate the importance of the medicinal plant garden to the public that used it, structured interviews were employed (Alexiades, 1996) with all the 40 people, 28 women and 12 men, who visited the garden during the period of investigation, with no other criterion of inclusion in the sample. The interview and questionnaire were used to collect information concerning: the use-frequency of the garden; the possibility of altering the garden plot, the distribution and layout of the plantings; their use of the public health center and their opinion about the treatment they received there; the type of infirmity they were seeking to treat with traditional remedies; their knowledge of the identify and preparation of them; if they felt that the use of traditional remedies was compatible with industrialized medicines; and in which situations they preferred to seek treatment in the public health services, the pharmacies, or in the medicinal garden.

RESULTS

This study examined 96 species belonging to 44 plant families (Table 1). The families with the greatest number of species were: Asteraceae, Lamiaceae, Euphorbiaceae, Malvaceae, and Poaceae. The habits of these plants were: herbaceous (51%), sub-shrub to shrub (35.4%), vines (7.3%), and trees (6.3%).

Within the community garden, 84.7% of the plants were used for medicinal purposes, 10.5% as food, and 4.8% were to be used in rituals. The largest

percentage of the medicinal plants were sought after for use in treatment of infirmities of the respiratory system (22 species), followed by illness effecting the skin and subcutaneous tissues (19), illnesses of the digestive system (16) and of the genital-urinary system (16), afflictions and indefinite pain (15), illness of the endocrine glands, nutrition, and metabolism (11), blood diseases and those of the hemopoetic organs (6), illnesses of the nervous system (6), illnesses of the circulatory system (5), infectious and parasitic diseases (4), viral infections (4), illnesses of the osteo-muscular system and connective tissues (3), neoplasms (2), illnesses of the hearing (2), illnesses of the eyes (1), cerebral vascular afflictions (1).

The Relative Importance index showed nine species with an RI > 1.0 that were indicated for use in up to four categories of illness. *Aloe vera* (babosa) and *Leonurus sibiricus* (erva-macaé) demonstrated the greatest RI (2.00), followed by *Echinodorus grandiflorus* (chapeu de couro, RI = 1.75), *Achillea millefolium* (mil folhas, RI = 1.75), *Alpinia zerumbet* (colônia, RI = 1.75) *Calendula officinalis* (calendula, RI = 1.50), *Artemisia absinthium* (losna, RI = 1.25), *Mirabilis jalapa* (maravilha, RI = 1.25), *Polygala* sp. (vick, RI = 1.25).

The medicinal garden uses surveyed were almost exclusively residents of the municipality of Casimiro de Abreu, both in the village and in the countryside areas. Thirty-five percent visited the garden on a weekly basis, 25% monthly, 22.5% visited occasionally, while 17.5% were first-time rural users.

Sixty-five percent of the rural users to the medicinal garden already knew what plant they wished to use, while 35% (including all of the first-time rural users) sought the advice of the garden's administrator. Half of the interviewees (49%) sought cures for infirmities of the respiratory tract, a fact that corresponds to the large variety of plants cultivated for these treatments.

Ninety-five percent of the interviewees knew how to prepare the folk remedy. Only 23% simultaneously used both the herbal remedy and a commercially available pharmaceutical product. However, 60% of the interviewees said they would only visit the Health Station if the symptoms were very serious. Additionally, 42.5% of the interviewees indicated that they would purchase industrialized pharmaceuticals in order to treat serious illnesses, 42.5% would purchase them only if they had sufficient monetary resources, while 15% would only purchase a medicine if the appropriate herbal medicine was not available in the community garden.

DISCUSSION

Almeida & Albuquerque (2002) examined the commerce of medicinal plant and animal species in one of the most important popular markets in Brazil (the Feira de Caruaru, in the state of Pernambuco). They were able to identify 114 species of plants belonging to 57 families, the most important being Lamiaceae, Leguminosae, Euphorbiaceae, Lauraceae, Asteraceae, and Bignoniaceae. Likewise, Amorozo (2002), examined the medicinal plants used in a rural community in the state of Mato Grosso, and were able to identify 228 species belonging to 73 families, the most important being Euphorbiaceae, Asteraceae, Leguminosae, Lamiaceae, Poaceae, and Solanaceae. Parente & Rosa (2001) also examined medicinal plants being sold in a small open market in the municipality of Barra do Piraí, Rio de Janeiro, and were able to identify 101 species belonging to 42 families, the most important being Asteraceae, Lamiaceae, Bignoniaceae, Verbenaceae, Solanaceae, and Poaceae. The results of these various authors agreed with the observations made in the community garden studied here in terms of the importance of the families Asteraceae and Lamiaceae.

The study carried out by Almeida & Albuquerque (2002) examined a commercial market for medicinal plants, and the sellers would presumably chose those plants that they sold from a wider spectrum of available plants according to their commercial value and/or according to popular demand, which might even be influenced, in turn, by popular television programs, without any scientific basis. This commercial selection may interfere in the number of illness categories stocked, in contrast to the free medicinal garden under study.

The elevated number of plants indicated for treating respiratory afflictions that were growing in the medicinal garden in this study coincides with the results obtained by Amorozo & Gély (1988) and Almeida & Albuquerque (2002) in the populations they studied.

The Relative Importance (RI) values obtained in the present work demonstrated a low versatility of the species considered when compared to the results obtained by Almeida & Albuquerque (2002) in the Feira de Caruaru, where nine species demonstrated a RI > 1.0, and some were used to treat up to eight disease categories.

The edible plants examined in the present study are largely herbaceous, and are used as spices in the local cooking, and include: basilicão (*Ocimum basilicum*), alecrim (*Rosmarinus officinalis*), tomilho (*Thymus vulgaris*), and oregano (*Origanum vulgare*). Some plants grown in the communal garden are directly eaten, such as the fruits: figs (*Ficus carica*), amora-preta (*Morus nigra*), pitanga (*Eugenia uniflora*), and bajurú (*Chrysobalanus icaco*).

Another use category is of plants used in cult religions, such as: comigo-ninguém-pode (*Dieffenbachia picta*), espada-de-São-Jorge (*Sansevieria trifasciata*), guiné-piu-piu (*Petiveria alliacea*), and arruda (*Ruta graveolens*). These plants are widely used to ward off the olho-do-diabo and in ritualistic baths. trevo-de-quatro-folhas (*Marsilea* sp.) is sought after to bring good luck, especially by children.

The role of medicinal plants in traditional medicine has grown significantly in recent decades, and its future growth will require continuous adaptations to the requirements for quality, security and efficiency

of modern medicine. This continual evolution of phyto-therapy will necessarily involve doctors, pharmacists, pharmacologists, chemists, botanists and agronomists, among others (Miguel & Miguel, 1999).

The folk remedies prepared under indication of local medicinal gardeners, however, may not be qualified as phytomedicines, concerning Anvisa requirements, due to the lack of standardization of their raw materials and the extraction processes (Marques & Petrovick, 2003). The preference for their use, as well as of medicinal plants over commercially available medicines is in part related to the belief that they provide a more natural and "healthy" treatment, and the herb-seller plays and important role in diagnosing and recommending treatments (see Parente & Rosa, 2001).

The lone administrator of the medicinal garden examined in this study is recognized as a secure source of information about which plants to use, how to prepare them, their dosage, and the duration of treatment. It should also be pointed out that this worker has had no formal training in gardening, works without any official orientation or training from any government organ, and there has been no institutional programs developed to pass on his acquired knowledge to future generations.

CONCLUSION

The communal medicinal plant garden at Casimiro de Abreu contained a total of 96 plant species, an expressive number in terms of the human and financial resources allocated by the local government and the size of the area itself.

The results presented here may be useful in educational programs by public health officials, designed to preserve and foster traditional knowledge that has unfortunately been eroded by the migration of rural populations to urban areas, making it more difficult to recover information concerning the potential use of native or endemic species of the Atlantic Coastal Forest. The widespread use of non-local or even exotic species by rural communities in this region testifies to the lose of this local knowledge and the urgency of trying to rescue it.

As such, any at all initiatives in this direction by the local government or social entities should attempt to follow the guidelines set down by the Brazilian Health System (SUS). These guidelines recommend programs and activities designed to provide effective pharmaceutical assistance to all Brazilian citizens, including phyto-therapeutic remedies (Ministério da Saúde, 2006), and would, at the same time, help increase our understanding of the folk knowledge of these rural populations that is slowly and silently eroding, as well as provide more health opportunities for the poor rural populations.

Table 1. Plants cultivated in the community medicinal garden in Casimiro de Abreu, RJ, Brazil.

Family/Species	Common name	Medicinal use	Plant part utilized
ALISMATACEAE			
Echinodorus grandiflorus (Cham. & Schltdl.) Micheli	chapéu-de-couro	d, k, m	lf
AMARANTHACEAE			
Iresine herbstii Hook.	orelha-de-moleque	e	lf
Pfaffia paniculata (Mart.) Kuntze	novalgina, ginseng	i	st, lf
ANACARDIACEAE			
Schinus terebinthifolius Raddi	aroeira	n	lf
ANNONACEAE			
Annona muricata L.	graviola	c	lf
APIACEAE			
Foeniculum vulgare Mill.	erva-doce	g, p	st, lf
ARACEAE			
Dieffenbachia picta Schott	comigo-ninguém-pode	-	ent
Pistia stratiotes L.	erva-de-santa-luzia	f	lf
ASTERACEAE			
Achillea millefolium L.	mil-folhas	d, j, k	st, lf
Ageratum conyzoides L.	erva-de-são-joão	g	lf
Arctium minus (Hill) Bernh.	bardana	k	lf
Artemisia absinthium L.	losna	j, k	lf
Baccharis trimera (Less.) DC.	carqueja	c, j	lf
Bidens pilosa L.	picão	j, k	ent
Calendula officinalis L.	calêndula	g, l, m	lf
Cichorium intybus L.	almeirão-roxo	j	ro, st, lf
Coreopsis grandiflora Hogg ex Sweet	camomila	g	st, lf
Cynara scolymus L.	alcachofra	c	lf
Elephantopus mollis Kunth	erva-grossa	i	lf
Mikania glomerata Spreng.	guaco	a, i	st, lf
Solidago chilensis Meyen	arnica	l	lf
Tagetes erecta L.	cravo-de-defunto	m	lf
Tanacetum vulgare L.	palma-de-santa-rita	l	lf
Vernonia condensata Baker	boldo-do-chile	j	lf
Vernonia polyanthes Less.	assa-peixe	i	lf

BIXACEAE			
Bixa orellana L.	orucum	i	lf
BORAGINACEAE			
Cordia sp.	baleeira	d	lf
Symphytum officinale L.	confrei	c, n	lf
BUXACEAE			
Buxus sempervirens L.	bucho	i	lf
CAPRIFOLIACEAE			
Sambucus nigra L.	sabugueiro	o	st, lf
CECROPIACEAE			
Cecropia glaziovi Snethlage	embaúba	c, l	lf
CHENOPODIACEAE			
Chenopodium ambrosioides L.	erva-de-santa-maria	a	st, lf
CHRYSOBALANACEAE			
Chrysobalanus icaco L.	bajurú	c	lf
CONVOLVULACEAE			
Cuscuta sp.	cipó-chumbo	i	st
COSTACEAE			
Costus arabicus L.	cana-de-macaco	k	lf
Costus spiralis (Jacq.) Roscoe	cana-de-macaco	k	lf
CRASSULACEAE			
Kalanchoe brasiliensis Cambess.	saião	i	lf
CUCURBITACEAE			
Luffa operculata (L.) Cogn.	buchinha-do-norte	i, k	fr
Momordica charantia L.	melão-de-são-caetano	k, l	st, lf
EQUISETACEAE			
Equisetum hyemale L.	cavalinha	k	lf
EUPHORBIACEAE			
Acalypha communis Müll. Arg.	parietália	k	lf
Euphorbia sp.	quebra-pedra	k	ent
Jatropha aff. multifida L.	mercúrio	l	la
Jatropha gossypiifolia L.	pinhão-roxo	l	la
Euphorbiaceae sp.	bálsamo	l	lf
LAMIACEAE			
Leonotis nepetifolia (L.) R. Br.	cordão-de-frade	n	st, lf, fl
Leonurus sibiricus L.	erva-macaé	d, j, n, o	lf
Mentha arvensis L.	hortelã	i	lf
Mentha pulegium L.	poejo	i	st, lf
Ocimum basilicum L.	manjericão	e, i	lf
Ocimum gratissimum L.	alfavaca	i	st, lf
Ocimum selloi Benth.	anis	j	st, lf
Origanum vulgare L.	orégano	-	lf
Plectranthus amboinicus (Lour.) Spreng.	hortelã-pimenta	i	lf
Plectranthus barbatus Andrews	boldo	j	st, lf
Plectranthus grandis (Cramer) R. Willemse	alcachofra	c, j	lf
Rosmarinus officinalis L.	alecrim	h, i	st, lf
Thymus vulgaris L.	tomilho	j	st, lf
Lamiaceae sp1.	alevante	i	lf
LEGUMINOSAE – CAESALPINOIDEAE			
Bauhinia radiata Vell.	pata-de-vaca	c	lf
LILIACEAE			
Aloe vera (L.) Burm. f.	babosa	b, k, l, n	lf
Sansevieria trifasciata Prain	espada-de-são-jorge	-	ent
LYTHRACEAE			
Cuphea carthagenensis (Jacq.) J.F. Macbr.	sete-sangrias	h	lf
MALVACEAE			
Gossypium hirsutum L.			
Malachra heptaphylla Saint-Hilaire	algodoeiro	n	lf
Malva sylvestris L.	malva	n	lf
MARSILEACEAE			
Marsilea sp.	trevo-de-quatro-folhas	-	ent

MORACEAE			
Ficus carica L.	figo	i	lf, fr
Morus nigra L.	amora	a, n	lf, fr
MYRTACEAE			
Eucaliptus sp.	eucalipto	i, o	lf
Eugenia uniflora L.	pitanga	l, n	lf, fr
Myrciaria glomerata O. Berg	cabeludinha	-	fr
NYCTAGINACEAE			
Mirabilis jalapa L.	maravilha	l, n	lf
PAPAVERACEAE			
Argemone mexicana L.	cardo-santo	j	lf
PHYTOLACCACEAE			
Petiveria alliacea L.	guiné-piu-piu	-	ent
PIPERACEAE			
Piper mollicomum Kunth	aperta-ruão	d	st, lf
Pothomorphe umbellata (L.) Miq.	capeba	j, k	lf, fl
PLANTAGINACEAE			
Plantago major L.	tanchagem	j	lf
POACEAE			
Coix lacryma-jobi L.	lágrima-de-nossa-senhora	k, n	st, lf
Cymbopogon citratus (DC.) Stapf	capim-cidreira	g	st, lf
Cymbopogon densiflorus (Steud.) Stapf	cachalao	j	st, lf, fl
POLYGALACEAE			
Polygala sp.	vick	i, o	st, lf
POLYGONACEAE			
Polygonum hydropiperoides Michx.	erva-de-bicho, cata-cataia	d, l	lf
PUNICACEAE			
Punica granatum L.	romã	n	fr
RUBIACEAE			
Chiococca alba (L.) Hitchc.	cura-tombo	l	lf
RUTACEAE			
Ruta graveolens L.	arruda	-	ent
SOLANACEAE			
Nicotiana tabacum L.	fumo	a	lf
Solanum cernuum Vell.	panacéia	n	lf
URTICACEAE			
Urtica sp.	urtiga-branca	l	lf
VERBENACEAE			
Aloysia gratissima (Gillies & Hook.) Tronc.	alfazema	l	st, lf
Lippia alba (Mill.) N.E. Br.	erva-cidreira	g	st, lf
Stachytarpheta cayennensis (Rich.) Vahl	gervão-roxo	i, j	st, lf
VITACEAE			
Cissus verticillata (L.) Nicolson & C.E. Jarvis	insulina	c	st, lf
Vitaceae sp.	mãe-boa	l	st, lf
ZINGIBERACEAE			
Alpinia zerumbet (Pers.) B.L. Burtt & R.M. Sm.	colônia	c, h, k	lf, fl
Zingiber officinale Roscoe	gengibre	i	ro

Conventions: Use: food (foo); medicinal (med); ritual (rit). Medicinal use: a) infectious and parasitic diseases; b) neoplasms; c) illness of the endocrine glands, nutrition, and metabolism; d) blood diseases and those of the hemopoetic organs; e) illnesses of the sense organs (hearing); f) illnesses of the sense organs (eyes); g) illnesses of the nervous system; h) illnesses of the circulatory system; i) illnesses of the respiratory system; j) illnesses of the digestive system; k) illnesses of the genital-urinary system; l) illnesses of the skin and subcutaneous tissue; m) illnesses of the osteo-muscular system and connective tissues; n) afflictions and indefinite pain; o) viral infections; p) cerebral vascular afflictions. Plant part utilized: entire plant (ent); root (ro), stem (st); leaf (lf); flower (fl); fruit (fr); latex (la). Form of preparation: bath (bat); decoction (dec); gargle (gar); in natura (in); inhalation (inh); infusion (inf); ointment (oin); juice (jui); tincture (tin); vapor (vap); syrup (syr). RI: relative importance index.

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