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Centennial Knowledge of Medicinal Plants Held in Communities of Espírito Santo, Brazil

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Research

Abstract

The naturalist Auguste Saint-Hilaire, during a visit to Espírito Santo in 1826, recorded the popular use of some native plants, cited by the vernacular names **fedegoso-do-mato**, **milhomens**, **erva-do-brejo**, **taririquim**, **batata-de-junça**, and **jarro**. The aim of this study was to collect and systematize information about popular medicinal plants used in Afonso Cláudio, including the ones mentioned by Saint-Hilaire. The method used was a semi-structured snowball type research. Most of the 34 participants reported to know some of the plants cited by Saint-Hilaire, except the one known as **jarro**. The use of 156 ethnospecies was recorded, 60 of them were collected. These plants belong to 30 families, predominantly Lamiaceae and Asteraceae. Most of them were indicated to treat cough and stomach problems. The results indicate that in the area there is knowledge of native and exotic medicinal plants, and the species mentioned by Saint-Hilaire are still remembered.

Introduction

The state of Espírito Santo (ES) has high levels of biodiversity and was therefore visited by various naturalists, among them Auguste Saint-Hilaire (Saint-Hilaire 2002). During his visit to ES in 1826, the naturalist reported a treatment of snake bites using three plants: two *Aristolochia* species (known as **milhomens** and **jarro**) and the **batata de junça** (also mentioned as **erva do brejo**). Besides the tea dispensed to slaves there were also administered extracts of the roots of **taririquim** or **fedegoso-do-mato**, species of *Cassia* that possess the same properties of *Cassia occidentalis* L. (a synonym of *Senna occidentalis* (L.) Link) (Saint-Hilaire 2002). The city now known as Afonso Cláudio, located in the mountain region of Espírito Santo that once belonged to the Cachoeira de Santa Leopoldina County, is between the regions visited by the naturalist, and part of its territory is covered by the Atlantic Forest (IBGE 2013).

The territory was first inhabited by Botocudos Indians that were replaced in the ninth century by Catholic families coming from the states of Rio de Janeiro and Minas Gerais, attracted by gold exploration (Vieira 2009), and also by Italian and German settlers, who had agriculture as their main activity (Vieira 2009). This is still the main activity in the region, facilitating contact with nature and developing in the inhabitants a deeper knowledge of plants and their use for healing purposes, as observed in other regions of Brazil (Gandolfo & Hanazaki 2011).

The urbanization of rural regions has endangered environmental conservation areas and could also contribute to cultural erosion (Medeiros *et al*. 2004). However, in some communities of ES, the descendants of the ancient inhabitants still remember some practices, continuing certain habits even ahead of modernism (Albertasse *et al*. 2010,

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Medeiros *et al*. 2004). Thus, the study by Saint-Hilaire could be a useful indicator of the conservation of knowledge over two hundred years of history in this region.

Ethnobotanical studies that search to rescue traditional botanical knowledge related to a specific flora (Marinho *et al*. 2011) have shown to be an important tool to record plant data (Brandão *et al*. 2009, Gandolfo & Hanazaki 2011). Currently, the use of plants is normally for therapeutic purposes and based on popular knowledge. That information may lead to scientific studies and even the development of new drugs (Albertasse *et al*. 2010, Medeiros *et al*. 2004).

In Espírito Santo, ethnobotanical surveys are not as well utilized as they could be since the state has great cultural and ethnic diversity that may be better investigated (Albertasse *et al*. 2010). The present study aimed to recover and systematize information about popular medicinal plants used and verify if the ones cited by Saint-Hilaire are still known in the city of Afonso Cláudio with a population that has different ethnicities including Caucasians, Africans, and Indians.

Material and Methods

For six months (August 2011 to February 2012), an ethnobotanical survey was conducted in Afonso Cláudio, ES, Brazil. The city has an area of 951 km^2, has an estimated population of 31,091 inhabitants, and is 146 km from the capital Vitória, with predominantly Atlantic Forest as natural vegetation (IBGE 2013).

Through a preliminary survey with the residents of the city a key informant was selected, characterized by being a person recognized by the community as holding knowledge about medicinal plants, called “traditional connoisseurs” (healers, chanters, **caboclos**, and others). From there the approach used was a semi-structured snowball method (Albuquerque & Lucena 2004, Fuck *et al*. 2005).

The questionnaire collected general information about respondents and also covered socio-economic data (Edwards *et al*. 2005, Siddique *et al*. 2005). Within the questionnaire, the respondents were asked in a direct approach whether or not they knew the six plants mentioned by Saint-Hilaire when he was in ES, namely: f**edegoso-do-mato**, **milhomens**, **erva do brejo**, **taririquim**, **batata de junça**, and **jarro**.

After this direct approach, the interview continued more informally, where respondents were allowed to say freely which plants they used in their routine as well as the therapeutic purpose, mode of administration, method of production, and part of the plant used. The informal approach of the questionnaire allowed respondents to express their opinions, viewpoints, and arguments. All respondents participated in the study voluntarily and had knowledge of the subject and the purpose of the study (Conde *et al*. 2014). The procedure was approved by Ethics in Human Committee of University Vila Velha (CEP-UVV 183/09). The study included adult residents of the region, excluding those who declined to participate or did not agree to be recorded.

After the interview, the species of medicinal plants cited by key informants were photographed, collected when possible, and dated, and relevant information for species recognition was recorded such as habitat, color, smell, and morphological characteristics, among others. The samples were collected in backyards and on stretches of bushland near the homes of the respondents.

All of the documented plants were vouchered and identified by collecting vernacular name(s) and uses. They were then verified either by botanists from the Department of Botany, Federal University of Espírito Santo, Vitória, Brazil (Dr. Luciana Dias Thomaz), or University Vila Velha, Vila Velha, Brazil (Msc. Solange Zanotti Schneider), where voucher specimens are deposited.

Results

The ethnobotanical survey at Afonso Cláudio showed that the local people are generally familiar with medicinal plants, and experienced individuals are known in their communities as healers. Thirty-four healers were interviewed in this study (Table 1).

All the social data collected indicated that most of the people identified as knowledgable about medicinal plants are predominantly female, mothers, and over fifty years of age. They normally were raised in the region and due to rural routine may not have access to education.

All participants showed knowledge about medicinal plants (between 6–10 species). Each reported knowing the popular name of at least one of the plants mentioned by Saint-Hilaire, **fedegoso-do-mato** (n = 12) and **milhomens** (n = 11) being the most cited, followed by **erva do brejo** (n = 5), **taririquim** (n = 3), and **batata de junça** (n = 2). The **jarro** plant was not cited by any informant. These medicinal plants were cited in the direct approach of the questionnaire.

In addition, all informants were able to provide the main therapeutic indications, namely the treatment of gastrointestinal and kidney problems, inflammations, pain, and cough. A total of 57 medicinal plants were documented. The reported medicinal plants comprised 50 genera and 32 plant families and are listed in Table 2, where the scientific and vernacular names, status, plant parts used, a description of the uses, the number of popular uses, and the voucher number are depicted. Considering all the study

Table 1. Demographic data of the informants from communities of Espírito Santo, Brazil.

	n	%		n	%
Gender			**Children**		
Female	25	74	Yes	19	95
Male	9	26	No	1	5
Age			**Civil status**		
31-40	3	9	Single	0	0
41-50	4	12	Married	23	68
>50	27	79	Partner	1	3
Origin			Divorced	3	9
Native	0	0	Widow	7	20
Black	1	3	**Education**		
Brown	4	12	Grammar school	25	74
Mongolian	1	3	High school	4	12
Mulatto	4	12	Undergraduate	5	14
Caucasian	24	71	Graduate	0	0

Table 2. Medicinal plants used in Afonso Cláudio, Espírito Santo, Brazil. Status: native (N), introduced (I). Plant part used: bark (B), leaf (L), liana (Li), flower (Fl), fruit (Fr), petals (P), resin (Re), root (R), seed (S), Floral stigma/style or silk (Si). Plant scientific nomenclature was checked against TROPICOS (www.tropicos.org).

Species (voucher number)	Vernacular name(s)	Status	Part used	Medicinal use	Report use
Acanthaceae					
Justicia pectoralis Jacq. (UVVES 2387)	**Anador**	N	L	Pain, flu, headache, sedation, fever	3
Alismataceae					
Sagittaria sp.(UVVES 2380)	**Sagitária**		L	Wound	1
Amaranthaceae					
Dysphania ambrosioides (L.) Mosyakin & Clemants (UVVES 2402)	**Erva de Sta Maria**	I	L	Worm	3
Gomphrena globosa L. (UVVES 2366)	**Perpétua**	I	Fl	Uterine infection	2
Pfaffia glomerata (Spreng.) Pedersen (UVVES 2395)	**Pifáfia**	N	L, R	Cleanser, fever	1
Annonaceae					
Annona muricata L. (UVVES 2352)	**Graviola**	I	L	Hypertension, cancer	2
Annona coriacea Mart. (UVVES 2403)	**Articum**	I	L	Antidepressant	1
Apiaceae					
Anethum graveolens L. (UVVES 2364)	**Aipo**	I	L	Stomachache, stomach, flatulence, anti-inflammatory, expectorant, menopause	4
Pimpinella anisum L. (UVVES 2382)	**Erva doce**	I		Headache, pressure, flu, soothing cough	4

Species (voucher number)	Vernacular name(s)	Status	Part used	Medicinal use	Report use
Apocynaceae					
Cynanchum roulinioides (E.Fourn.) Rapini (UVVES 2374)	**Milhomens**	I	Li	Cut off the snake venom, liver	2
Asteraceae					
Achillea millefolium L. (UVVES 2400)	**Milramos, milfolhas**	I	L	Bleeding, stomach, intestines, fever, rickets	3
Acmella ciliata (Kunth) Cass. (UVVES 2393)	**Necroton**	N	L	Liver	2
Baccharis trimera (Less.) DC. (UVVES 2351)	**Carqueja**	N	L	Stomach	5
Bidens pilosa L. (UVVES 1932)	**Picão**	N	L	Hepatitis	3
Matricaria recutita L. (UVVES 2358)	**Camomila**	I	Fl, L	Virus, stomach, vertigo, headache, indigestion, stomach ache	8
Mikania banisteriae DC. (UVVES 2399).	**Cipó cabeludo**	N			1
Mikania spp. (UVVES 2365)	**Guaco**	N	L	Cough, expectorante	3
Parthenium hysterophorus L. (UVVES 2360)	**Losna-branca**	I	L	Digestive problems	1
Vernonanthura phosphorica (Vell.) H.Rob. (UVVES 2359)	**Assa Peixe**	N	L, Fl	Headache, lung, cough	6
Bignoniaceae					
Amphilophium crucigerum (L.) L.G.Lohmann (UVVES 2390)	**Pente de macaco**	I	R, S	Stomach, purifying, soothing, rheumatism, antidepressant	5
Bixaceae					
Cochlospermum sp. (UVVES 2373)	**Bactrim**		L	Kidney infection	1
Boraginaceae					
Symphytum officinale L. (UVVES 2369)	**Confrei**	I	L	Rheumatism	1
Cactaceae					
Opuntia sp. (UVVES 2376)	**Palma**		L	Headache, delayed menstruation	1
Caryophyllaceae					
Polycarpon sp. (UVVES 2386)	**Erva-sabão**		L	Wash hands	1
Costaceae					
Costus spicatus (Jacq.) Sw. (UVVES 2405)	**Cana de macaco**	N	L	Kidneys, abortive	7
Cucurbitaceae					
Momordica charantia L. (UVVES 2356)	**Melão São Caetano**	I	Fr	Diabetes	1
Sechium edule (Jacq.) Sw. (UVVES 2384)	**Chuchu**	I	L	Hypertension	5
Cupressaceae					
Cupressus sp.(UVVES 2378)	**Tuia**	I	L	Cancer	1
Fabaceae					
Senna alexandrina Mill. (UVVES 2392)	**Sene**	I	L	Intestine	1

Species (voucher number)	Vernacular name(s)	Status	Part used	Medicinal use	Report use
Hypericaceae					
Hypericum perforatum L. (UVVES 2370)	**Erva de São João**	I	L	Edema, allergy	2
Lamiaceae					
Leonurus sibiricus L. (UVVES 2388)	**Macaé**	I	Fl, L	Fever, abdominal pain, liver problems, dizziness, stroke, poor digestion, hypertension	10
Melissa officinalis L. (UVVES 2396)	**Melissa**	I	L	Cough, soothing, headache	3
Mentha spp. (UVVES 2372)	**Hortelã**	I	L	Vomiting, dyspepsia, worms, flatulence, abdominal pain, plaster, soothing	7
Mentha spicata L. (UVVES 2401)	**Levante**	I	L	Flu	1
Ocimum basilicum L. (UVVES 1927)	**Alfavaca**	I	L, Fl	Soothing, flu, cough, cold, headache	2
Ocimum basilicum var. *purpurascens* Benth. (UVVES 2406)	**Manjericão roxo**	I	L	Heart	1
Plectranthus ornatus Codd (UVVES 2408)	**Boldo pequeno**	I		Headache, liver, stomach, vomiting	5
Plectranthus barbatus Andrews (UVVES 2355)	**Boldo**	I	L	Headache, liver, stomach, vomiting	4
Rosmarinus officinalis L. (UVVES 2363)	**Alecrim**	I	L	Heart, flu, soothing	5
Lauraceae					
Persea americana Mill. (UVVES 2385)	**Abacate**	I	L	Soothing, anti-inflammatory, kidney, varicose veins, leg pain	6
Lythraceae					
Cuphea carthagenensis (Jacq.) J.F.Macbr. (UVVES 2398)	**Sete-sangria**	N	L	Cholesterol	1
Malvaceae					
Hibiscus sp. (UVVES 2375)	**Azedinha**	I	L	Wounded mouth	1
Myristicaceae					
Virola oleifera (Schott) A.C.Sm. (VIES19648)	**Bicuíba**	N	Re	Analgesic, healing, anti-inflammatory	8
Myrtaceae					
Eucalyptus spp. (UVVES 2368)	**Eucalipto**	I	L	Breathing problems	2
Oxalidaceae					
Averrhoa carambola L. (UVVES 2391)	**Carambola**	I	Fr	Diabetes	1
Piperaceae					
Piper umbellatum L. (UVVES 2353)	**Pariparoba**	I	L	Liver	1
Plantaginaceae					
Plantago major L. (UVVES 2394)	**Tranchagem**	I	L	Wound, antibiotics, thrush, infection, inflammation	4

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Species (voucher number)	Vernacular name(s)	Status	Part used	Medicinal use	Report use
Poaceae					
Cymbopogon citratus (DC.) Stapf (UVVES 2379)	**Capim cidreira**	I	L	Pain-headed, calming	4
Zea mays L. (UVVES 2383)	**Tendão de milho, cabelo de milho**	I	Si	Cough	1
Rosaceae					
Rosa alba L. (UVVES 2407)	**Rosa branca**	I	P	Stomach, headache, purifying, soothing, uterine infection	4
Rutaceae					
Citrus limon (L.) Osbeck (UVVES 2404)	**Limão**	I	L	Flu	1
Citrus sp. (UVVES 2381)	**Tangerina**	I	L, B	Labyrinthitis	3
Ruta graveolens L. (UVVES 2367)	**Arruda**	I	L	Flu, skin irritation, uterine cramping	4
Solanaceae					
Solanum cernuum Vell. (UVVES 2397)	**Panacéia**	N	L	Depurative	1
Verbenaceae					
Lippia alba (Mill.) N.E.Br. ex Britton & P.Wilson (UVVES 2137)	**Erva cidreira**	N	L	Headache, pressure, flu, coughs, soothing	7
Stachytarpheta sp. (UVVES 2377)	**Gervão**		R, L	Cough, boils, liver problems, stomach	3
Zingiberaceae					
Zingiber officinale Roscoe (UVVES 1918)	**Gengibre**	I		Pain	1

sites in Afonso Cláudio, 61% of the medicinal plants are introduced, probably related to colonization, and 39% are native. Most healers use plants that are easily accessible and available for the treatment of minor and common illnesses. The most reported plants were **macaé** (*Leonurus sibiricus* L., n = 10), **cana de macaco** (*Costus spicatus* (Jacq.) Sw., n = 10), **bicuíba** (*Virola oleifera* (Schott) A.C.Sm., n = 8), and chamomile (*Matricaria recutita* L., n = 8).

Discussion

Respondents were mostly female, over 50 years old, and married or widowed with children. This information corroborates data from other studies (Albertasse *et al*. 2010, Marchese *et al*. 2009, Roque *et al*. 2010) in which elderly women tend to be knowledgeable about plants whose medicinal uses are passed along generations. Women are considered the family's keeper, ensuring good health and a quick recovery, in case of sickness.

Empiric knowledge is a knowledge acquired through daily routine and has no scientific evidence. The use of plants with medicinal purposes in this age group indicates inheritance of knowledge (Oliveira & Menini Neto 2012, Pilla *et al*. 2006). Among the respondents, 95% had children and claim those children show interest in using plants for therapeutical purposes.

This result differs from another study (Roque *et al*. 2010) in which the authors were afraid that knowledge might be lost due to easy access to medical care and drugstores. In some regions, including hinterland areas like Afonso Cláudio, the tradition in using medicinal plants is maintained across generations.

The majority of interviewees of Caucasian origin in the present study could be related to the immigration of Europeans in the nineteenth century seeking climates mimicking their homeland in the mountainous regions of the state of Espírito Santo (Marchese *et al*. 2009, Medeiros *et al* 2004). Citations of several diseases for some plants may be related to an environmental and climatic characteristic of the region (Marchese *et al*. 2009).

Most of people interviewed declared to be Catholic. The colonization of Espírito Santo included Jesuits' involvement and may have contributed to the prevalence of that religious denomination in this region. Moreover, it is necessary to consider the Europeans, who predominantly practiced Catholicism, which probably contributed to some of the results in the survey. However, this study is not population-based, so we can only state on the empirical sample studied.

Regarding the plants mentioned by the respondents, the most-cited families were Asteraceae and Lamiaceae, results similar to other ethnobotanic studies in Espírito Santo (Albertasse *et al*. 2010, Gallote & Ribeiro 2005) and in Brazil (Marchese *et al*. 2008). This result could be related to the fact that these families are easy to cultivate and are mostly herbaceous plants.

The use of plants for stomach problems corroborates with the findings of other studies (Albertasse *et al*. 2010, Gallote & Ribeiro 2005). Of the plants cited in the survey of Albertasse *et al*. (2010), many were also mentioned by the respondents of this study, indicating common cultural traditions.

However, in the unplanned demonstration on popular use, only **milhomens** was mentioned once. The **millhomens** species was collected and identified as *Cynanchum roulinioides* (E.Fourn.) Rapini, Apocynaceae (UVVES 2374). It was spontaneously mentioned as useful for the treatment of snake bites, although it was used as a tourniquet and not applied orally. In contrast, the plant called **millhomens** used as antivenom and formally quoted by Saint-Hilaire was a species of the genus *Aristolochia* within Aristolochiaceae (Saint-Hilaire 2002), indicating that the popular name was transmitted but with a loss of some knowledge about the identity of the species and its previous manner of use. This loss may be justified by the fact that Saint-Hilare studied most of the plants by their popular name. According to analysis from the Saint-Hilaire virtual herbarium, several species from Aristolochiaceae were known as **millhomens**, but none of them were identified within the samples.

Plants cited less frequently in this study as compared to Saint-Hilaire might be due to current perceived dangers in forested areas such as crawling animals, snakes, or difficult access to these plants. For example, **erva do brejo** requires going to the swamp for collection.

Although the region of study is within the Atlantic Forest area and the houses of the key informants are close to the woods, most of the species that were cited and identified (63%) are exotic, similar to what was described in other Atlantic Forest region studies (Albertasse *et al*. 2010, Pinto *et al*. 2006). As mentioned by Marchese *et al*. (2009), the great number of exotic plants may have been brought by the Europeans.

These results represent the Brazilian plurality, whose nation building was influenced by natives, Africans, and Europeans (Brandão *et al*. 2009). These findings are related to (1) the natural ease and practicality of growing these exotic medicinal plants in backyards (Albertasse *et al*. 2010, Pinto *et al*. 2006), (2) the predominant use by women who would fear a trip to the forest, and (3) the preference of this kind of cultivation and exploration of exotic plants.

The practice of using natural products to treat ailments in an alternate or supplemental way to synthetic drugs is old, yet still has an important role in global health (Maciel 2002, Sousa *et al*. 2008). Despite advances in the pharmaceutical industry and the ease and accessibility of acquisition of medicines, the use of medicinal plants in some regions is still common in curative and palliative treatments (Sousa *et al*. 2008). The practice of using medicinal plants in Afonso Cláudio is still alive, and such aptitude for their use is related to household farming, rather than resorting to curative ways in establishments of allopathic medicines. Thus the inhabitants can be defined as conservative of a rich knowledge of plants that is continuously passed from generation to generation, making them extremely valuable for future scientific and cultural research. This survey showed that although this popular knowledge is old and was reported about 200 years ago by the botanist Saint-Hilaire, it still remains among the local people.

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