



## Useful Brazilian plants listed in the field books of the French naturalist Auguste de Saint-Hilaire (1779–1853)

Maria G.L. Brandão<sup>a,\*</sup>, Marc Pignal<sup>b</sup>, Sergio Romaniuc<sup>c</sup>, Cristiane F.F. Graef<sup>d</sup>, Christopher W. Fagg<sup>e</sup>

<sup>a</sup> DATAPLANT, Museu de História Natural e Jardim Botânico and Faculdade de Farmácia, Universidade Federal de Minas Gerais, 31080-010 Belo Horizonte, Brazil

<sup>b</sup> Muséum national d'Histoire naturelle, UMR 7205, Paris, France

<sup>c</sup> Instituto de Botânica do Estado de São Paulo, Av. Miguel Stéfano 3687, 04301-910 São Paulo, Brazil

<sup>d</sup> Departamento de Farmácia, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, Brazil

<sup>e</sup> Faculdade de Ceilândia and Departamento de Botânica, Universidade de Brasília, Brasília, Brazil

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### ABSTRACT

**Ethnopharmacological relevance:** Information regarding the use of beneficial, native Brazilian plants was compiled by European naturalists in the 19th century. The French botanist Auguste de Saint-Hilaire (1779–1853) was one of the most important such naturalists; however, his manuscripts (field books) have not yet been studied, especially in the context of useful plants.

**Aim of the study:** To present data documented by Saint-Hilaire in his field book regarding the use of native plants by the Brazilians.

**Materials and methods:** Data on useful plants were obtained from field books (six volumes) deposited in the Muséum national d'Histoire naturelle in Paris, France. The vernacular names of the plants, registered as “N.V.” or “Nom Vulg.” in the field book, were carefully searched. Traditional information about these plants was translated and organised using a computer. The botanical identification of each plant was determined and updated from the original descriptions and names cited in the field books by A. de Saint-Hilaire. Correlated pharmacological studies were obtained from PubMed.

**Results:** A total of 283 useful plants were recorded from the field books and 165 (58.3%) could be identified to genus or species. Fifty-eight different traditional uses were registered for the identified plants; the most common were as purgatives and febrifuges. Other data recovered were related to edible fruits and plants with interesting sensorial characteristics. For the few species that have been subjected to laboratory studies, the efficacy of the recorded traditional uses was confirmed.

**Conclusion:** The data recorded by the French naturalist A. de Saint-Hilaire represent a rich, unexplored source of information regarding the traditional uses of Brazilian plants.

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### 1. Introduction

The use of natural compounds from biological sources, as well as ethnobotanical knowledge, remains an important source for the development of new commercial products (Li and Vederas, 2009; Desmarchelier, 2010; Newman and Cragg, 2012). Brazil is rich in useful plant species as a result of its vast biodiversity and rich history of traditional uses that have been practiced by Americans for centuries (Nogueira et al., 2010). However, the intense destruction of Brazil's floristically rich native ecosystems through the slashing and burning of fields for cattle pastures (Brandão et al., 2004; Shanley and Luz, 2003) or, more recently, for soybean cultivation and biofuel production (Sawyer, 2008), has led to a gradual loss of medicinal species. This situation

highlights the importance of recovering information regarding the traditional uses of plants to evaluate their potential and promote the adequate exploration and conservation of these species.

Brazil was colonised by the Portuguese from 1500 to 1822, and foreign interest in the potential of Brazil's biodiversity was evident from the beginning of its colonisation. Jesuit priests were the first to make direct contact with the native Brazilians, and they quickly incorporated native plant species into their practice of European medicine. One example is *Teriac* (Triaga), an ancient remedy used to treat fevers and poisoning, in which the components of the original European recipe were gradually substituted with plants native to Brazil. The Brazilian Triaga was composed of roots of *Chondrodendron* spp. (Menispermaceae), *Cocculus* spp. (Menispermaceae) and *Cissampelos* spp. (Menispermaceae), *Aristolochia* spp. (Aristolochiaceae), *Piper umbellatum* L. (Piperaceae), *Solanum paniculatum* L. (Solanaceae), *Pilocarpus* spp. (Rutaceae), *Senna occidentalis* (L.) Link. (Fabaceae), *Hybanthus ipecacuanha* (L.) Oken. (Violaceae), *Carapichea ipecacuanha* (Brot.)

\* Corresponding author. Tel.: +55 3134096970; fax: +55 3134096935.  
E-mail address: [mbrandao@ufmg.br](mailto:mbrandao@ufmg.br) (M.G.L. Brandão).

L. Andersson (Rubiaceae) and *Dorstenia* spp. (Moraceae), the bark of *Dicypellium caryophyllatum* (Mart.) Nees. (Lauraceae), *Angelica archangelica* L. (Apiaceae) and *Pradosia lactecens* (Vell.) Radlk. (Sapotaceae), seeds of *Xylopia* spp. (Annonaceae) and *Bixa orellana* L. (Bixaceae), *Euphorbia hirta* L. (Euphorbiaceae) and *Myroxylon balsamum* (L.) Harms (Fabaceae) (Pereira et al., 1996). Other Europeans who lived or travelled throughout the country also recorded information about useful native plants from Brazil, including the French, such as André Thevet and Jean de Lery, and the Portuguese, such as G.S. Souza in the 16th century, and Holland G. Piso in the 17th century. Their books describe several native medicinal plants used by the native Brazilians (Thévet, 1557; Léry, 1580; Pisonis, 1648; Souza, 1938). The data contained in these books served as the primary source of information on Brazilian biodiversity until the end of the 18th century, when it was replaced with the work of Portuguese and Brazilian authors such as Bernardino A. Gomes, Frei Mariano C. Vellozo and Alexandre R. Ferreira (Stellfeld, 1952; Vellozo, 1961; Gomes, 1972; Ferreira, 2002). In 1808, the Portuguese royal family moved to Rio de Janeiro, fleeing their home country after Napoleon Bonaparte's invasion, and additional European naturalists travelled Brazil and documented the use of medicinal plants (Brandão et al., 2011). The French botanist Auguste de Saint-Hilaire (1779–1853) was one of the first scientists to obtain permission to freely travel the Brazilian territories, which he did from 1816 to 1822.

Saint-Hilaire was born in 1779 in Orléans, France, and died in 1853. From an early age, he was trained by his father to work in business, but his real interest was in the natural sciences. Saint-Hilaire travelled throughout the southwest and southern regions of Brazil up to the Cisplatina Province (currently Uruguay) (Leite, 1996). His collections (almost 7000 species, with 4500 unknown to science at the time) are deposited in the *Muséum national d'Histoire naturelle* in Paris, with many duplicates in Montpellier (France). In 1824, he published two books, *Plantes usuelles des Brésiliens* (Saint-Hilaire, 1824a) and *Histoire des plantes les plus remarquables du Brésil et du Paraguay* (Saint-Hilaire, 1824b), where the uses of some species are described. He had a special interest in the description of plant diversity, and many botanical genera and species new to science were described by Saint-Hilaire. Upon his return to France, Saint-Hilaire worked on the *Flora Brasiliæ Meridionalis* (Saint-Hilaire et al., 1825–1833). This work was the first systematic treatment of the vegetation of southern and central Brazil. His contribution to the knowledge of Brazilian vegetal biodiversity is incalculable: hundreds of new species were discovered and innumerable new genera were described with the material that he collected. His travels were also documented in several books, published in France from 1830 to 1848, however their field books have not yet been studied. In the present study, we present the initial data documented by Saint-Hilaire in those field books regarding the use of native plants by Brazilian people. This study is part of a larger project on the recovery and translation of the works of Saint-Hilaire into Portuguese, of which three books have been translated (Saint-Hilaire, 2009, 2011a, 2011b).

## 2. Methods

### 2.1. Survey of A. de Saint-Hilaire's field books

Data on the use of native plants were obtained from the field books of A. de Saint-Hilaire, which are deposited in the *Muséum national d'Histoire naturelle* (MNHN), in Paris, France. The field books are composed of seven volumes: A1 and A2 (series A), B1 and B2 (series B), C1 and C2 (series C) and D. Each plant collected by Saint-Hilaire while he travelled throughout Brazil was registered in his field book with a number. In the A1 and A2 field books, plants collected in Rio de Janeiro are recorded (plant

numbers 1 to 758); field book B1 documents plants from Rio de Janeiro and Minas Gerais (26 to 2085); in the first part of B2, plants from Minas Gerais are recorded (2101 to 2493), and in the second part, plants collected in Espírito Santo and Rio de Janeiro are recorded (1 to 408); C1 represents plant data from Minas Gerais (11 to 625); C2 contains plant data from São Paulo, Santa Catarina, Rio Grande do Sul and Uruguay (1176 to 2797); and D contains plant data from Minas Gerais (31 to 587). The C2 field book was not used in this study. A study of the botanical catalogues of the field work of Saint-Hilaire was published by Dwyer (1955), and all field books are available on the website of the virtual herbarium of A. Saint-Hilaire at <http://hvsh.cria.org.br/works> (Romaniuc-Neto and Pignal, 2010).

In this survey, we have prioritised plants that were registered by Saint-Hilaire with the acronyms “N.V.” or “N.Vulg.” (*nom vulgaire* in French), which means “vernacular or common name”. Thus, vernacular names for plants were carefully searched for in each field book, entered into a computer and organised in Tables 1 and 2. The botanical name (species or genus) of each retrieved plant was identified using one of the four following methods (marked with letters a to g in Table 1): The letters “a”, “b”, “f” and “g” were attributed to plants that corresponded to the data organised by Saint-Hilaire in the following books: species published in the *Plantes usuelles des Brésiliens* (Saint-Hilaire, 1824a) were marked with “a”; information obtained from the Portuguese version of Saint-Hilaire's travel diaries, published in 1975, and available at the website [www.dataplant.org.br](http://www.dataplant.org.br) were marked with “b”; species published in *Histoire des plantes les plus remarquables du Brésil et Paraguay* (Saint-Hilaire, 1824b) were marked with “g”, and species in *Flora Brasiliæ Meridionalis* (Saint-Hilaire, Jussieu, Cambedess, 1825–1833) were marked with “f”. For many plants, it was possible to associate the number of the plant registered in the field book with the herbarium sample also collected by A. de Saint-Hilaire; this information is also available in the virtual herbarium of Saint-Hilaire (<http://hvsh.cria.org.br/>). This site is still under construction, but much information can already be found there (denoted with “e” in Table 1). Many identifications were performed by associating the field book data directly with the voucher herbarium sample searched in MNHN in Paris (marked with “c”). In some cases, the scientific name was written by Saint-Hilaire directly in the field book (marked with “d”). Additional information was obtained from the Portuguese version of Saint-Hilaire's travel diaries, published in 1975 (Saint-Hilaire, 1975a, 1975b, 1975c, 1975d), and available at the website [www.dataplant.org.br](http://www.dataplant.org.br). The scientific names and families were confirmed by consulting the original collections of the *Muséum national d'Histoire naturelle* in Paris (<http://www.mnhn.fr/base/sonnerat.html>), the Flora do Brasil (<http://floradobrasil.jbrj.gov.br/2012>) and in the Plant List (<http://www.theplantlist.org>) websites.

### 2.2. Survey of the traditional uses of plants recorded in the field books

Data regarding the traditional uses of each plant (written in the field book in French or Portuguese) were translated into English and are integrated into Tables 1 and 2. Different species with the same vernacular name and traditional uses are presented together as the *Annona* spp. (araticum, Annonaceae), *Croton* spp. (vellame do campo, Euphorbiaceae), *Psidium* spp. (arassá, araçá, Myrtaceae) and *Polygonum* spp. (erva de bicho, Polygonaceae). Plants with observations about a sensorial characteristic (odour, taste and colour) are also included in Table 1. Plants that could not be identified by their botanical names, but had a documented traditional use recorded in the field books were considered in this study and are included in Table 2. Beyond

**Table 1**

Traditional uses for native species recorded by A. de Saint-Hilaire in his fieldbook and data about recent correlated laboratory studies.

Names of family and species	Data in fieldbook		Recent studies correlated to traditional uses
	Original names written by Saint-Hilaire and number of collection	Traditional uses	
<b>AMARANTHACEAE</b>			
<i>Gomphrena arborescens</i> L.f. (= <i>G. officinalis</i> Mart.) <sup>a,b</sup>	Perpetua, paratudo [B1-136]	Bitter root, used for the throat; anti-scorbutic	None
<b>ANACARDIACEAE</b>			
<i>Anacardium humile</i> A. St.-Hil. <sup>c,d</sup>	Caju do campo [B1-1756; C1-854]	Edible fruits	None
<i>Schinus terebinthifolius</i> Raddi. <sup>b,c,e</sup>	Aroeira/terebinthacée [A1-400; B1-279]	Fresh leaves have a varnish odour; it is stated that the body swells when sleeping under the shade of the tree	Presence of volatile oil (El-Massry et al., 2009; Bendaoud et al., 2010; Sallam et al., 2011)
<b>ANNONACEAE</b>			
<i>Annona squamosa</i> L., <i>A. reticulata</i> L., <i>A. sylvatica</i> A. St.-Hil., <i>A. glabra</i> L. (= <i>A. palustris</i> L.), <i>A. cornifolia</i> A. St.-Hil. <sup>e,a,f,b</sup>	Araticum/Annonée [B1-792]	The fruits are eaten, they are the size of a small apple (pomme de Reinette). There are several species	Nutritional value (Gupta et al., 2005)
<i>Duguetia furfuracea</i> (A. St.-Hil.) Saff. (= <i>Annona furfuracea</i> A. St.-Hil.) <sup>d,f,b</sup>	Araticum/ <i>Annona furfuracea</i> [B1-1258]	Edible fruits	None
<i>Guatteria villosissima</i> A. St.-Hil. <sup>e,f</sup>	Pindaíba [B1-606]	Light wood	None
<i>Xylopia sericea</i> A. St.-Hil. <sup>e,a</sup>	Annonea [A1-668]	Not described	Not applicable
<b>APOCYNACEAE</b>			
<i>Hancornia speciosa</i> Gomes <sup>e,c,b</sup>	Mangabeira [B1-1395; B2-1383 <sup>bis</sup> , C1-793]	Edible fruits	None
<i>Himatanthus drasticus</i> (Mart.) Plumel <sup>b</sup>	Tiborna [B1-1747 <sup>bis</sup> ; B1-1870 <sup>5</sup> ]	Roots used in the cerrado as a purgative, they are bitter and a little nauseating	None
<i>Himatanthus lancifolius</i> (Müll. Arg.) Woodson <sup>e</sup>	Para tudo [D-42]	Bitter bark, used for fevers	None
<i>Mandevilla velame</i> Pichon (= <i>Macrosiphonia velame</i> (A. St.-Hil.) Müll. Arg.) <sup>e,c,d,b</sup>	Cha de General/Apocinaceae/ <i>Echites vellame</i> [C1-380; C1-611(9)], <i>Vellame</i> [B1-202]	Decoction of leaves to treat indigestion and stomach troubles	None
<b>AQUIFOLIACEAE</b>			
<i>Ilex paraguayensis</i> A. St.-Hil. <sup>c,d,g,b</sup>	Erva de Mate ou Congonha/ <i>Ilex paraguayensis</i> [D-384 <sup>ter</sup> ]	Not described	Not applicable
<b>ARISTOLOCHIACEAE</b>			
<i>Aristolochia cymbifera</i> Mart. & Zucc. <sup>e,c,d,b</sup>	Taro/ <i>Aristolochia cymbifera</i> [B2-327] <i>Aristolochia</i> [D-178]	Leaves used in decoction to treat erysipelas	Antimicrobial (Machado et al., 2005; Alviano et al., 2008)
<b>ASTERACEAE</b>			
<i>Achyrocline satureioides</i> (Lam.) DC. <sup>e</sup>	Marcela/Borraginée [B1-1567]	For treating pain, used in the bath	Analgesic (Simões et al., 1988).
<i>Ageratum fastigiatum</i> (Gardner) R.M. King & H. Rob. <sup>e</sup>	Matta pasto [B1-303]	Flowers are viscous with a strong smell. Not grazed by cattle	Presence of volatile oil (Del-Vechio-Vieira et al., 2009a, 2009b; Gonçalves et al., 2011)
<i>Baccharis genistelloides</i> subsp. <i>crispa</i> (Spreng.) Joch. Muell. (= <i>B. trimera</i> (Less.) DC., <i>B. crispa</i> Spreng.) <sup>e,c,d,b</sup>	Carqueja/Composé, <i>Baccharis trimera</i> [B1-492; D-69]	Whole plant is extremely bitter, more bitter than quinine and Gentian, used to treat intermittent fevers	None
<i>Elephantopus mollis</i> Kunth <sup>b</sup>	Herva montana, Herva collegio no Rio, Fumo Bravo, Susualha/Composée [A1-186; D-737]	Often used for respiratory diseases	None
<i>Melampodium</i> sp. <sup>e,d</sup>	Puejo da Praia, Carapixu, Composée, <i>Melampodium</i> [A1-164; B2-2209 <sup>bis</sup> ]	It is bitter and used successfully as a febrifuge. Used for treatment of “gallico”	None
<i>Gymnanthemum amygdalinum</i> (Delile) Sch. Bip. ex Walp. (= <i>Vernonia condensata</i> Baker) <sup>b</sup>	Aça pece branco, Assa pece branco/Composée [B1-1598; B1-1870 <sup>ter</sup> ]	Pleasant odour. The same use as salsaparrilha and caju do campo for venereal disease	None
<b>BIGNONIACEAE</b>			
<i>Handroanthus ochraceus</i> (Cham.) Mattos <sup>e,c</sup>	Ipê mirim/Bignonia [B1-735]	Flowers are sudorific, similar to caroba	None
<i>Jacaranda caroba</i> (Vell.) DC. <sup>e,c,d,b</sup>	Caroba/Bignonia [B1-1841; C1-506]	Whole plant used to treat venereal diseases	None
<b>BIXACEAE</b>			
<i>Cochlospermum regium</i> (Mart. ex Schrank) Pilg. <sup>e,c,a,f</sup>	Butua do Curvo [C1-604]	Decoction of the roots is used against internal pains, from kicking and other accidents	None
<b>CANNABACEAE</b>			
<i>Celtis iguanaea</i> (Jacq.) Sarg. <sup>e</sup>	Incenso mirim [B1 1877]	Edible fruit said to be the size of a gooseberry	None
<b>CLUSIACEAE</b>			
<i>Garcinia gardneriana</i> (Plach. & Triana) Zappi <sup>b</sup>	Bacopari [B1-1648]	Edible yellow fruit the size of a lime, contains latex	None
<i>Kielmeyera speciosa</i> A. St.-Hil. <sup>a,f,b</sup>	Malva do campo, folha santa, pinhão/Gutiferée [C1-455]	Leaves are emollients and used in baths	None
<b>COMBRETACEAE</b>			
<i>Combretum laxum</i> Jacq. (= <i>C. bugi</i> Cambess) <sup>e,f</sup>	Bugi [B1-1844]	Very pleasant odour	None
<b>COMMELINACEAE</b>			
<i>Commelina erecta</i> L. <sup>d,b</sup>	Trapoeiraba/ <i>Pontederia</i> , <i>Commelina</i> [B1-714]	Refreshing plant	None

Table 1 (continued)

Names of family and species	Data in fieldbook		Recent studies correlated to traditional uses
	Original names written by Saint-Hilaire and number of collection	Traditional uses	
<b>CONVOLVULACEAE</b>			
<i>Cuscuta umbelata</i> Kunth <sup>e</sup>	Cipo de xumbo/Convolvulaceae, Cuscute [C1-665]	Respiratory diseases	None
<i>Evolvulus glomeratus</i> Ness & C. Mart. <sup>e</sup>	Virtuosa/Convolvulaceae [D-467 <sup>bis</sup> ]	People of Iuroca use whole plant decoction for healing poisonous snake bites	None
<i>Merremia tomentosa</i> Choise Hallier f. (= <i>Batatas tomentosa</i> Choisy) <sup>e</sup>	Vellame [B1-1930; D-344; C1-691]	Root frequently used to treat “bubouns”. Purgative. Famous for treating “gallico”	None
<b>CRASSULACEAE</b>			
<i>Kalanchoe crenata</i> (Andrews) Haw. <sup>e,d,f</sup>	Saião/Crassulêe/Cotyledon, <i>Kalanchoe brasiliensis</i> [A1-54]	Refreshing	None
<b>CUCURBITACEAE</b>			
<i>Apodanthera pedisecta</i> (Nees & Mart.) Cogn <sup>e</sup>	Abobora do Matto/Cucurbitacée [B1-662; B1-1581]	Purgative, decoction of leaves produces a yellow colour	None
<i>Apodanthera smilacifolia</i> Cogn. <sup>e</sup>	Fedorenta [B1-736]	Purgative	None
<i>Luffa sepium</i> (G. Mey.) C. Jeffrey <sup>e</sup>	Purga de Cereja/Cucurbitacée [B1-520]	Excellent purgative, one fruit dose for men and three or four for horses. Disagreeable odour	None
<b>CYPERACEAE</b>			
<i>Cyperus brevifolius</i> (Rottb.) Endl. ex Hassk. (= <i>Killingia brevifolia</i> Rottb.) <sup>e</sup>	Tunça [B1-1030]	Wild root has a pleasant smell and is used against snake bites	None
<b>DILLENIACEAE</b>			
<i>Davilla elliptica</i> A. St.-Hil. <sup>e,c,d,a,f</sup>	Sambaibinha, Licha pequena [B1-1386 <sup>bis</sup> ]	Used externally for inflammation of the legs and testicles	Antiinflammatory (Kushima et al., 2009)
<i>Davilla rugosa</i> Poir. <sup>a,f</sup>	Sambaibinha, Cipó de Carijó [B1-1079; C1-268]	Same use as previous	None
<b>DROSERACEAE</b>			
<i>Drosera villosa</i> A. St.-Hil., <i>D. montana</i> A. St.-Hil. (= <i>D. parviflora</i> A. St.-Hil.), <i>D. graminifolia</i> A. St.-Hil., <i>D. communis</i> A. St.-Hil., <i>D. sessilifolia</i> A. St.-Hil. <sup>e,c,d,a,g,b</sup>	<i>Drosera</i> , <i>Drosera villosa</i> [D-146; B1-1988; C1-75], <i>D. montana</i> [D-377, D-542], <i>D. graminifolia</i> [B1-448; B1-2021 <sup>bis</sup> ], <i>D. communis</i> [B1-448; B1-695; D-722; D-414], <i>D. sessilifolia</i> [B1-1805 <sup>bis</sup> ]	Poisonous to cattle	None
<b>ERYTHROXYLACEAE</b>			
<i>Erythroxylum campestre</i> A. St.-Hil. (= <i>E. cotinifolium</i> A. St.-Hil.) <sup>e</sup>	Fruta de tucano do campo, <i>Erythroxylum</i> [D-460 <sup>bis</sup> ]	Not described	Not applicable
<i>Erythroxylum suberosum</i> A. St.-Hil. <sup>e,a,b</sup>	Gallinha choca, Mercúrio do Campo [B1-1899]	Bark provides a red dye that is soluble	None
<b>EUPHORBIACEAE</b>			
<i>Croton antisiphiliticus</i> A. St.-Hil. <sup>e,d,a</sup>	Alcamphora, Pé de perdiz, Cocolera/ <i>Croton perdicipes</i> [C1-611-8; C1-227]; Vellame do campo [B1-2155 <sup>bis</sup> ]	Leaves to treat wounds, snake bites, as a diuretic and anti-syphilis	None
<i>Croton campestris</i> A. St.-Hil. <sup>e,c,d,a</sup>	Vellame do campo <sup>e</sup> , Vellame, <i>Croton/Croton campestris</i> [B1-1114; B1-1131; B1-1323; B1-1971 <sup>bis</sup> ; B1-2387; B2-2155 <sup>bis</sup> ; B2-2387; B2-2155 <sup>bis</sup> ]	Roots purgative, to treat wound and syphyilis boubons against the “gallico” and snake bites. Same uses as Vellame ( <i>Batatas tomentosa</i> )	Antimicrobial (Pereira et al., 2011)
<i>Euphorbia hyssopifolia</i> L. <sup>e,d</sup>	Herva de Santa Luzia/ <i>Euphorbia brasiliensis</i> [A1-127]	Latex is used to treat eye diseases. Called Herva de Santa Luzia after the saint which believed it cures inflamed eyes	None
<i>Jatropha elliptica</i> (Pohl) Oken <sup>b</sup>	Serpentaria, Herva de cascavel, Raiz de tiu/Composée [B1-1396]	Roots with a strong musk odour. It is a powerful antidote against snake bites, even the most venomous. Roots are grated.	Against inflammation caused by jararaca (snake) bites (Trebien et al., 1988)
<i>Maprounea brasiliensis</i> A. St.-Hil. <sup>e,a</sup>	Marmeleiro do campo/ Euphorbiêe [B1-1651; C1-479]	Leaves are boiled with (... to obtain a black ink for dyeing cotton. This dye is not fixed. Decoction of root for stomach disorders	None
<i>Tragia chlorocaulon</i> Baill. <sup>e</sup>	Cansação [B1-1611]	Not described	Not applicable
<b>FABACEAE</b>			
<i>Albizia inundata</i> (Mart.) Barneby & J.W. Grimes. (= <i>Cathormium polyanthum</i> (Spreng.) Burkart.) <sup>e</sup>	Munquim, <i>Mimosa</i> [B1-1837]	Used for eye disorders of horses	None
<i>Anadenanthera</i> sp. <sup>d,b</sup>	Angico/ <i>Mimosa</i> [B1-357]	Bark is used in tanning	Presence of tannins (Melo et al., 2010; Oliveira et al., 2011)
<i>Andira fraxinifolia</i> Benth. <sup>e</sup>	Angelim [B1-1040; B2-79 <sup>bis</sup> ]	People grind the bark into powder and drink in small doses (about 4 grains) in 2 tablespoons to kill worms. Repeat a second	Antihelminthic (Silva et al., 2003)

Table 1 (continued)

Names of family and species	Data in fieldbook		Recent studies correlated to traditional uses
	Original names written by Saint-Hilaire and number of collection	Traditional uses	
<i>Andira humilis</i> Benth. <sup>e,b</sup>	Angelim [C1-196 <sup>4</sup> ]	time if necessary. Care needed, bark is poisonous	Not applicable
<i>Bonia coriaceae</i> (Nees & Mart.) Benth. (= <i>Campotosema coriaceum</i> Benth.) <sup>e</sup>	Leguminosée [B1-1113]	Not described	None
<i>Caesalpinia echinata</i> Lam. <sup>d</sup>	Pau Brasil/ <i>Caesalpinia</i> [A1-158]	The roots are very bitter and used against fevers	None
<i>Cassia grandis</i> L.f. <sup>b</sup>	Canna fistula [B2-2229 <sup>bis</sup> ]	The Wood is red and provides by decoction an ink similar to Campeche plant	None
<i>Cleobulia multiflora</i> Benth. <sup>e</sup>	Cipó pé de gallina [B1-704]	Bark used in tanning, has a resin like Arabic gum	Presence of tannins (El-Hashash et al., 2010)
<i>Hymenaea stigonocarpa</i> Mart. ex Hayne <sup>e,b</sup>	Jatobá [B1-1031 <sup>bis</sup> ]	They made excellent cords	None
<i>Inga</i> sp. <sup>a,e</sup>		Resin used internally to treat gonorrhoea and together with copaiba oil to treat fractures	Antibacterial (Novais et al., 2003)
<i>Inga marginata</i> Willd <sup>e</sup>	Inga [A1-513; B1-683]	Not described	Not applicable
<i>Lonchocarpus costatus</i> Benth. <sup>e</sup>	Inga miúdo/Leguminosae [C1-841; D-599 <sup>bis</sup> ]	Not described	Not applicable
<i>Machaerium stipitatum</i> (DC.) Vogel <sup>e</sup>	Angelim doce [B1-1045]	No known use	Not applicable
<i>Periandra dulcis</i> Mart. <sup>e</sup>	Picão do campo [C1-260]	Not described	Not applicable
<i>Platymiscium floribundum</i> Vogel var. <i>nitens</i> (Vogel) Klitg. <sup>e</sup>	Alcassus [B1-752; D-199]	Root has the same taste as reglise and used for the same purpose	Presence of sweet saponins (Suttisri et al., 1993; Hashimoto et al., 1983)
<i>Pterodon emarginatus</i> Vogel (= <i>P. polygalaeiflorus</i> (Benth.) Benth.) <sup>e</sup>	Pau D'arco [C1-837]	This is not the pau d'arco wood that is used in the construction or the so-called caraíba	None
<i>Senna splendida</i> (Vogel) H.S.Irwin & Barneby <sup>e</sup>	Socopira [C1-898], Monjolo [B1-2065 <sup>bis</sup> ]	Good wood for building	None
<i>Sophora tomentosa</i> subsp. <i>littoralis</i> (Schrad.) Yakovlev <sup>e</sup>	Sambaiba [B1-1848]	Bark is used in decoction to cure “anostemos”	None
<i>Stryphnodendron adstringens</i> (Mart.) Coville <sup>d,b</sup>	Feijões da praya [A2-99B]	Not described	Not applicable
<i>Swartzia</i> sp. <sup>e</sup>	Barbatimão/ <i>Mimosa</i> [A1-404]	The bark is used in tanning	Presence of tannins (Santos et al., 2002; Marino et al., 2009)
<b>GENTIANACEAE</b>	Ligadera [B1-741; B2-2205 <sup>bis</sup> ]	Juice of fresh leaves has marvellous properties for treating fresh wounds	Antimicrobial (Rojas et al., 2006; Magassouba et al., 2007)
<i>Calolisianthus speciosus</i> (Cham. & Schltdl.) Gilg. <sup>e</sup>	Cordão de Frade/Gentianée [C1-206]	Used as a diuretic	None
<i>Deianira nervosa</i> Cham. & Schltdl. <sup>e</sup>	Centaurea minor/Gentianée [B1-1135]	Plant very bitter; sudorific	None
<i>Deianira pallescens</i> Cham. & Schltdl. <sup>e</sup>	Centaurea branca [B1-1383]	Leaves are bitter	None
<b>LAMIACEAE</b>			
<i>Hesperozygis myrtoides</i> (A. St.-Hil. ex Benth.) Epling (= <i>Glechon myrtoides</i> A. St.-Hil. ex Benth.) <sup>e</sup>	Puejo do campo/Labiée [D-500]	Mint odour, decoction used in stomach disorders	None
<i>Hyptis brevipes</i> Poit. <sup>e,d</sup>	Betônica [B1-1398 <sup>bis</sup> ]	Good for bathing to prevent rheumatic pains. A powder can be put on the head	None
<i>Hyptis carpinifolia</i> Benth. <sup>e,d,b</sup>	Rosmaninho, Alegrim do Campo [B1-1797 6°; C1-305]	Very aromatic, rosemary smell. Used as bath for diseases of women	None
<i>Hyptis crinita</i> Benth. <sup>a</sup>	Flor de São João [B1-1224]	Not described	Not applicable
<i>Hyptis plectranthoides</i> Benth. <sup>a</sup>	Bertonica [D-277]	Used for stomach disorders. Said that the decoction makes a child to lose the habit of eating dirt.	None
<i>Rhaphiodon echinus</i> Schauer <sup>a</sup>	Serrilha [B1-1858]	Refreshing when applied to wounds	None
<b>LOGANIACEAE</b>			
<i>Buddleja stachyoides</i> Cham. & Schltdl. <sup>d,b</sup>	Verbasco sylvestre/ <i>Buddleia americana</i> [A1-398]	Not described	Not applicable
<i>Strychnos pseudoquina</i> A. St.-Hil. <sup>e,d,a,g,b</sup>	China do campo [B1-1367]/Quina de Mendanha [B1-1704 <sup>bis</sup> ] <i>Strychnos pseudoquina</i>	Looks like coffee, children eat the fruits. Very bitter, used against intermittent fevers	Antimalarial (Andrade-Neto et al., 2003)
<b>LYTRACEAE</b>			
<i>Lafoensia pacari</i> A. St.-Hil. <sup>f,b</sup>	Pacari [B1-1868]	Not described	Not applicable
<b>MALPIGHIACEAE</b>			
<i>Byrsonima sericea</i> DC. <sup>e,b</sup>	Murici/Malpighiée [A1-345, B1-372]	Bark astringent, used in tanning, source of a yellow dye.	None
<i>Byrsonima verbascifolia</i> (L.) Rich. ex Juss. <sup>e,b</sup>	Murici/Malpighiée [B1-1865; D-423]	Species of murici most consumed in cerrado	Nutritional value (Guimarães and Silva, 2008)
<i>Galphimia australis</i> Chodat <sup>e,f</sup>	Mal me quer do campo [C1-926]	Not described	Not applicable
<b>MALVACEAE</b>			
<i>Abutilon esculentum</i> A. St.-Hil. <sup>e,a,f</sup>	Benção de Deus/Malvaceae [A1-407]	Flowers eaten with meat	None
<i>Corchorus hirtus</i> L. (= <i>C. villosissimus</i> A. St.-Hil.) <sup>e</sup>	Xá dos paulistas, <i>Helicteres</i> [B1-1870 <sup>bis</sup> ]	Burning in urethra and urinary retention	None
<i>Guazuma ulmifolia</i> Lam. <sup>e,a,f,b</sup>	Mutamba [B1-1875; B1-1850; C1-737 <sup>bis</sup> ]	Inhabitants distinguish the two fruit sizes	None
<i>Helicteres sacarolha</i> A. St.-Hil., A. Juss. & Cambess. <sup>e,a,f</sup>		Decoction of roots to treat venereal diseases	None



Table 1 (continued)

Names of family and species	Data in fieldbook		Recent studies correlated to traditional uses
	Original names written by Saint-Hilaire and number of collection	Traditional uses	
<i>Luehea paniculata</i> Mart. <sup>d,a,f</sup>	Sacarolha, Rosca/ <i>Helicteres</i> /Malvée [C1-611 <sup>5</sup> ; B1-1274; D-608]		
<i>Sidastrum micranthum</i> (A. St.-Hil.) Fryxell <sup>e,a,f</sup>	Soita Cavallo, Soita de Cavallo/Malvacée [B1-698; B1-1038; B1-1726].	Used in tanning like angico, canafistula and inga. Also used to make shoe soles to protect the feet of people who work in the swamp	None
<i>Urena lobata</i> L. <sup>a,f</sup>	Malvalistro/Malvacée [B1-957]	Used for rocket sticks	None
	Malvalisco/Malvacée [B1-1393 <sup>bis</sup> ]	Roots in decoction for colic and expectorant	Antibacterial (Mazumder et al., 2001)
<b>MENISPERMACEAE</b>			
<i>Cissampelos ovalifolia</i> DC. (= <i>C. ebracteata</i> A. St.-Hil. <sup>e,c,d,a,f</sup> )	Orelha de Onça/Menispermée [C1-196 <sup>bis</sup> ; C1-608], Butua/ <i>Cissampelos</i> [A1-256; C1-650 <sup>bis</sup> ; C1-1045 <sup>bis</sup> ] ( <sup>h</sup> )	Decoction of bitter roots to treat intermittent fevers, febrifuge and hepatic	Antimalarial (Fischer et al., 2004; Steele et al., 2002)
<b>MORACEAE</b>			
<i>Brosimum gaudichaudii</i> Trécul. <sup>e</sup>	Fruta de gallo [C1-788]	Succulent plant, embryo bitter	None
<i>Dorstenia brasiliensis</i> Lam. <sup>e,b</sup>	<i>Dorstenia</i> [B1-1556]	Roots extremely bitter and febrifuge. I used myself with success	None
<i>Maclura tinctoria</i> (D. Don) Steud. (= <i>Chlorophora tinctoria</i> (L.) Gaud. subsp. <i>tinctoria</i> ) <sup>e</sup>	Amora de árvore, Urticée [B2-2196 <sup>bis</sup> ], Moreira [B1-1035] ( <sup>h</sup> )	White fruits are good to eat, leaves have mulberry smell	None
<b>MYRTACEAE</b>			
<i>Campomanesia pubescens</i> (DC.) O. Berg., <i>Psidium australe</i> var. <i>suffruticosum</i> (O. Berg.) Landrum, <i>P. cattleianum</i> Sabine, <i>P. guineense</i> Sw. <sup>e,f,b</sup>	Gabirola/Myrtée [D 293]; Arassá, Araçá/Mirtée [B2-2170; B2-221-9; D-370 <sup>ter</sup> ; D-370 <sup>4</sup> ; D-561]	Round yellow fruit, pleasant tasting, good to eat	Food (Caldeira et al., 2004)
<i>Eugenia dysenterica</i> DC. <sup>e,c,d,f,b</sup>	Cagaiteira/Myrtée, <i>Stenocalyx disenterica</i> [B1-1767; B1-1869]	Laxative to cattle	Laxative (Lima et al., 2010)
<i>Eugenia neoformosa</i> Sobral (= <i>E. formosa</i> Cambess. illeg.) <sup>f</sup>	Mama de caxorro [B1-2023]	Not described	Not applicable
<i>Eugenia punicifolia</i> (Kunth) DC. (= <i>E. adstringens</i> Cambess.) <sup>e,b</sup>	Mantimento de araponga [B2-153]	Succulent black astringent fruit with a very unpleasant taste	None
<i>Eugenia uniflora</i> L. <sup>f,b</sup>	Pittanguero/Myrtée [A1-354; A2-92B]	Edible fruits	Food (Freyre et al., 2000)
<i>Psidium grandifolium</i> Mart. ex DC. <sup>e</sup>	Gabirola/Myrtée [B1-121]	One of the several species of edible gabirola	None
<b>NYCTAGINACEAE</b>			
<i>Boerhavia coccinea</i> Mill. <sup>e</sup>	Herva tostão/Nictaginé, <i>Boerhavia</i> [A1-51]	Hepatic, is sold in pharmacies of R. de Janeiro	None
<b>OGNACEAE</b>			
<i>Luxemburgia poliandra</i> A. St.-Hil. <sup>e,g,f</sup>	Congogna do campo [B1-1367 <sup>bis</sup> ]	Bitter leaves	None
<i>Ouratea hexasperma</i> (A. St.-Hil.) Baill. <sup>e,a</sup>	Ochnée [B1-1620]	Not described	Not applicable
<b>ONAGRACEAE</b>			
<i>Ludwigia caparosa</i> (Cambess.) H. Hara (= <i>Jussiaea caparosa</i> Cambess.) <sup>e,f</sup>	Caparosa [B1-1396 <sup>bis</sup> ]	Vesicant	None
<b>ORCHIDACEAE</b>			
<i>Habenaria warmingii</i> Rchb. -f. <sup>e</sup>	Sumaré [B1-713]	Not described	Not applicable
<b>POACEAE</b>			
<i>Digitaria horizontalis</i> Willd. <sup>e</sup>	Pé de gallo/ <i>Paspalum</i> [A1-505]	Provides yellow dye, non fixing in cotton	None
<b>PASSIFLORACEAE</b>			
<i>Passiflora</i> sp. <sup>d,b</sup>	Maracujá mirim [B1-751]	Not described	Not applicable
<b>PIPERACEAE</b>			
<i>Piper</i> sp. <sup>d,b</sup>	Jaborandi/Piperacée [A1-197; B2-221-6 <sup>bis</sup> ; B2-346; A1-610]	Wood and bark are used for teeth ailments. Peppery taste refreshing like mint	Bactericidal, dental problems (Razak et al., 2006; Jayashankar et al., 2011)
<i>Piper umbellatum</i> L. (= <i>Pothomorphe umbellata</i> (L.) Miq.) <sup>e,d</sup>	Periperoba, Caapeba/ <i>Piper</i> [A1-577]	Decoction against pains, sweet taste	Analgesic (Perazzo et al., 2005)
<b>PLANTAGINACEAE</b>			
<i>Scoparia dulcis</i> L. <sup>d</sup>	Vassourinha doce/ <i>Scoparia</i> [D 449 <sup>ter</sup> ]	The roots are placed in (...) malignant	None
<b>POLYGONACEAE</b>			
<i>Polygonum glabrum</i> Willd./ <i>P. punctatum</i> Buch. -Ham. ex. D. Don (= <i>P. acre</i> Kunth.)/ <i>P. hydropiperoides</i> Michx. <sup>e,c,d</sup>	Erva de Bicho/ <i>Polygonum</i> [A1-511; B2-2200; A2-49; B1-230]	Plant is used in all troubles, and widely used among Brazilians. Made into a ball, inserted into the anus to improve atonia	Antiinflammatory (Singh et al., 1987); antihelmintic (Muddathir et al., 1987); antimicrobial (Bussmann et al., 2010)
<b>PONTEDERIACEAE</b>			
<i>Eichhornia crassipes</i> (Mart.) Solms <sup>e</sup>	Golsa [B1-1843]	Aromatic, for treating women's diseases	None
<i>Heteranthera reniformis</i> Ruiz & Pav. <sup>e</sup>	Folha do Brejo [B1-667]	Cooked leaves used in salads; are antiseptic and mucilaginous, the cooking water is used to treat cracking feet of black slave.	None

Table 1 (continued)

Names of family and species	Data in fieldbook		Recent studies correlated to traditional uses
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<b>RUBIACEAE</b>			
<i>Bathysa cuspidata</i> (A. St.-Hil.) Hook.f. ex K.Schum. <sup>e,a</sup>	Quina/Rubiacee [B1-970]	Not described	Not applicable
<i>Carapichea ipecacuanha</i> (Brot.) L.Andersson (= <i>Cephaelis ipecacuanha</i> Rich.) <sup>e,c,d,a,b</sup>	Poalha, <i>Psychotria emetica</i> [A1-615]	Emetic and purgative	Several studies (WHO, 2007)
<i>Chiococca alba</i> (L.) Hitchc. (= <i>C. anguifuga</i> Mart.) <sup>e,c,d,b</sup>	Raiz de Fratre, purga de cereja/Rubiée, <i>Chiococca anguifuga</i> [C2-1276; B1-521]	Root in cachaça (spirits) is used successfully to treat hysteria	None
<i>Chiococca</i> sp. <sup>e,c</sup>	Cainca, cainana [B2-2136 <sup>bis</sup> ]	Roots are purgative. One type of this plant is dangerous and should be administered with great caution	Toxic (Gazda et al., 2006)
<i>Palicourea marcgravii</i> A. St.-Hil. <sup>b</sup>	Erva de rato/Rubiaceae [B1-2209 <sup>d</sup> ]	Poisonous to cattle	Toxic (Moraes-Moreau et al., 1995; Kemmerling, 1996)
<i>Palicourea rigida</i> Kunth. <sup>e,g,b</sup>	Gritadera/Rubiaceae [C1-585; C1-611-6]	Diuretics, can cure boubons and eliminates the moods (toxins) in the urine. Leaves in decoction have good effect on dropsy	None
<i>Psychotria</i> sp. <sup>d</sup>	Herva de rato/ <i>Psychotria nocure</i> [B1-766]	Name is given any poisonous plant that cattle don't graze	Toxic (Mak et al., 1998; Carod-Artal, 2003)
<i>Remijia ferruginea</i> (A. St.-Hil.) DC. <sup>c,a,b</sup>	China de Rhemijo, China de fleur odorents [B1-1380]	Febri-fuge	Antimalarial (Andrade-Neto et al., 2003)
<i>Richardia brasiliensis</i> Gomes, <i>R. scabra</i> L. <sup>a,b</sup>	Poalha branca [B1-1002], Poalha do campo/Rubiaceae [C1-340]	Roots purgative and emetic, same effect as <i>Psychotria ipecacuanha</i> . The leaves taste sweet, acid, are used in decoction for colic and other internal pains	None
<i>Galium noxium</i> (A.St.-Hil.) Dempster (= <i>Rubia noxia</i> A. St.-Hil.) <sup>e,c,d,b</sup>	Herva de rato, <i>Gallium</i> [B1-563; B1-669]	Toxic to horses and mules that eaten them	None
<b>RUTACEAE</b>			
<i>Galipea jasminiflora</i> (A. St.-Hil.) Engl. <sup>c,d,a,g,f,b</sup>	Três folhas, laranjeira do matto/ <i>Ticorea jasminiflora</i> A. St.-Hil. [B1-697; B2-2460; D-33]	Very bitter plant, used successfully as a substitute for quina; juice of the leaves against venereal warts	None
<i>Zanthoxylum tingoassuiba</i> A. St.-Hil. <sup>c,d,f,b</sup>	Tingoassuiba/ <i>Zanthoxylum tingoassuiba</i> [B2-100]	Not described	Not applicable
<i>Salicaceae</i>			
<i>Casearia decandra</i> Jacq. <sup>d,g</sup>	Pioio/Samyda [B1-981]	Not described	Not applicable
<i>Casearia sylvestris</i> Sw. <sup>e,f</sup>	Língua de Tiú, Herva de vachero, Herva de São Gonçalo [B1-17964 <sup>°</sup> ], Chá de Frade, chá de patres de companhia [C1-8834 <sup>°</sup> ]	Anti-rheumatic and for treating inflammation. Leaf decoction for curing internal abscesses	Analgesic and antiinflammatory (Mattos et al., 2007; Esteves et al., 2005; Ruppelt et al., 1991)
<i>Casearia ulmifolia</i> Vahl ex Vent. <sup>f</sup>	Marmeleiro do matto [B1-608]	People say cures snake bites, even the most poisonous. Plant juice is drunk and also applied to the wound	None
<b>SAPINDACEAE</b>			
<i>Magonia pubescens</i> A. St.-Hil. (= <i>M. glabrata</i> A. St.-Hil.) <sup>e,d,g,f</sup>	Pao de Tingui [B1-1745]	Not described	Not applicable
<i>Sapindus saponaria</i> L. <sup>f</sup>	Sabonete à Sabará [B2-2288]	Fruits are used as soap	None
<i>Serjania lethalis</i> A. St.-Hil. <sup>d,b</sup>	Timbo [B1-1797]	The branches and leaves are beaten on the water which kill the fish on the surface	Ictiotoxic (Teixeira et al., 1984)
<i>Talisia esculenta</i> (A. St.-Hil.) Radlk. (= <i>Sapindus esculentus</i> A. St.-Hil.) <sup>e,c,a,f,b</sup>	Pittombero/Myrtée, <i>Stenocalyx desinterica</i> [B1-1892]	Fleshy fruits are appreciated by the inhabitants of the cerrado	None
<b>SIMARUBACEAE</b>			
<i>Simarouba versicolor</i> A. St.-Hil. <sup>a,f</sup>	Paraíba [B1-1835]	Give to horses	None
<b>SMILACACEAE</b>			
<i>Smilax hilariana</i> A.DC. <sup>e,c</sup>	Salsa, japecanga pequena [B1-774; B1-784]	Juice from leaves against (boubons) venereal warts, sudorific	None
<b>SOLANACEAE</b>			
<i>Cestrum martii</i> Sendtn. <sup>e,c,d,b</sup>	Coirana/ <i>Cestrum</i> [B1-1846 <sup>bis</sup> ]	Provides black ink that turns red with added lemon juice	None
<i>Cestrum laevigatum</i> Schltdl. (= <i>C. axillare</i> Vell.) <sup>e,d,b</sup>	Coirana/ <i>Cestrum</i> [B1-1403]	Leaves are poisonous and provides black ink	Poison (Peixoto et al., 2000; Van der Lugt et al., 1991)
<i>Physalis</i> sp. <sup>e,d</sup>	Batuchi, Juá/ <i>Physalis</i> /Solanée [A1-508; B2-2225]	Globular fruit are good to eat and tastes better than <i>Physalis peruviana</i>	Nutritional value (Bock et al., 1995; Mayorga et al., 2001; Murcia et al., 2001)
<i>Solanum alternato-pinnatum</i> Steud. <sup>e</sup>	Tiquiri/ <i>Solanum</i> [B1-1077]	Cooked leaves are eaten like cabbage and used as a gargle to treat the throat	None
<i>Solanum americanum</i> Mill. (= <i>S. nigrum</i> L.) <sup>e,d</sup>	Herva Moura/ <i>Solanum</i> [A1-245; A2-46B]	Juice is vulnerary. Fruit can be eaten but not very tasty	Nutritional value (Jimoh et al., 2010; Afolayan and Jimoh, 2008)
<i>Solanum cernuum</i> Vell. <sup>e</sup>	Vellame in Itabira, Mijo do gato/ <i>Solanum</i> [B1-740]	Sudorific, diuretic	None

Table 1 (continued)

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<i>Solanum crinitum</i> Lam. <sup>e</sup>	Barba de caboco [B1-1046]	Not described	Not applicable
<i>Solanum decompositiflorum</i> Sendt. <sup>e</sup>	Betônica [B1-366]	Strong odour	None
<i>Solanum diploconos</i> (Mart.) Bohs. <sup>e</sup>	Maracujá de morcego/Solanacée [C1-15]	Not described	Not applicable
<i>Solanum lycocarpum</i>	Arvore da Fruta do Lobo/ <i>Solanum</i> [B1-659; D-368]	Sweet taste and some people eat	Nutritional value (Clerici and Carvalho-Silva, 2011)
A. St.-Hil. <sup>e,c,d,b</sup>	<i>Solanum jurubeba</i> [B2-221-8]	Fruits are eaten cooked like tomatoes	Nutritional (Kinupp and Barros, 2008)
<i>Solanum paniculatum</i> L. <sup>d,b</sup>			None
<i>Solanum pseudoquina</i>	Quina/ <i>Solanum pseudoquina</i> [B2-356]	Not described	None
A. St.-Hil. <sup>d,c,a,g,b</sup>			
<b>SYMPLOCACEAE</b>			
<i>Symplocos celastrinea</i> Mart. ex Miq. <sup>e</sup>	Congonha miúda [B2-2206]; Congonha da miúda [D 483]	Leaves are used like mate, cut and roasted and taken for stomach pains. They are bitter.	None
<b>URTICACEAE</b>			
<i>Cecropia palmata</i> Willd., <i>C. pachystachia</i> Trécul <sup>c,d,b</sup>	Imbaúba Vermelha/ <i>Cecropia palmata</i> [A1-547]; <i>Cecropia pachystachia</i> Trécul [A1-554]	Not described	Not applicable
<b>VERBENACEAE</b>			
<i>Lippia pseudothea</i> (A. St.-Hil.) Schauer <sup>c,d,a,b</sup>	Capitão do matto, Xá de pedestre [B1-922]	Leaves give off a pleasant odour. The tea is very popular in the country	None
<b>VIOLACEAE</b>			
<i>Anchietea pyrifolia</i> (Mart.) G.Don. (=A. <i>pyrifolia</i> A. St.-Hil.) <sup>e,c,d,a,g</sup>	Suma/ <i>Anchietea pyrifolium</i> [B1-1048]	Red substance from bark is a potent purgative	None
<i>Hybanthus poaya</i> (A. St.-Hil.) Baill. <sup>e,c,d,a,g,f</sup>	Poalha/ <i>Ionidium poaya</i> [C1-611 <sup>7</sup> ; C1-653]; Poalha do campo [C1-864]; Poaya [B2-108]	Roots purgative and emetic, 12 “vintens” of weight taken to purge an adult	None
<i>Rinorea laevigata</i> (Sol. ex Ging.) Hekking <sup>d,a,g</sup>	Lobolobo/Viole, <i>Conohoria lobolobo</i> [A1-137]	Eaten like cabbage with meat	None
<b>VOCHYSIACEAE</b>			
<i>Qualea parviflora</i> Mart. <sup>e,d</sup>	Pau terra [B1-1360; B1-1953 <sup>bis</sup> ; B2-2357]; <i>Qualea</i> [C1-800]	Bark provides a bright yellow colour	None
<i>Salvertia convallariodora</i> A. St.-Hil. <sup>e,c,d,g,b</sup>	Pau de folha larga [B1-1744; C1-500]	Pleasant odour	None
<b>WINTERACEAE</b>			
<i>Drimys brasiliensis</i> Miers subsp. <i>brasiliensis</i> <sup>e,c,d,a,f,b</sup>	Casca d'Anta [B1-1031; B1-1669; C1-928; C1-44]	Leaves and bark are bitter, pungent, stimulating, and used to treat internal pains.	Analgesic and antiinflammatory (Lago et al., 2010)

Index: current scientific names from the information of b is available on website <http://www.dataplant.org.br>. Latin names in parenthesis are from virtual herbaria and bibliography, which are now synonyms.

<sup>a</sup> *Plantes usuelles des Brésiliens* (1824).

<sup>b</sup> Travel diaries (1830 to 1833).

<sup>c</sup> Herbarium voucher recorded in NMHN in Paris.

<sup>d</sup> Scientific names registered in the six fieldbooks.

<sup>e</sup> Virtual herbarium (<http://www.hsvh.cria.org.br>).

<sup>f</sup> *Flora Brasiliae Meridionalis* (1825 to 1833).

<sup>g</sup> *Histoire des plantes les plus remarquables du Brésil et Paraguay* (1824).

<sup>h</sup> Saint-Hilaire has considered as two different plants.

the important traditional information, it is possible that the identifications of these plants will be available in the virtual herbarium ([www.hvsh.cria.org.br](http://www.hvsh.cria.org.br)).

Many plants were not included in any table and not considered in this study because of a set of difficulties: (a) plants without a vernacular name, but with traditional uses, including *Lantana* [B1-1578], whose leaves have an unpleasant odour; a Composée [B1-536], used to control larvae that cause tumours in cattle; a Loranthacée [A1-141; A1-500], whose leaves, boiled with sugar, are employed as an enema for curing dysentery, it being slightly bitter and mucilaginous; and a Myrsinacée [B1-1872<sup>bis</sup>], whose leaves are good for adding to baths; (b) plants without a vernacular name and that were not identified, despite having a traditional use described, including numbers [B1-775] and [B1-776]; (c) plants for which the traditional uses were unreadable, including “Raiz de cobra” [B1-1626], Herva de passarinho [B1-1587] and Herva do Vigário [B1-931].

The orthographic variations in vernacular names that occurred between the registered data and the current plant names were also analysed. For example, the popular name registered as “aça pece” means “assa-peixe”; “carapixu” is “carrapicho” and “china do campo” is “quina do campo”. Vernacular names registered many times in a similar form were once considered “aça pece” and “assa pece”, “arassa” and “araça”, “açoita cavallo” and “açoita de cavallo”, “congonha miuda” and “congonha da miuda”, “canella d’Ema” and “canella de Hema”. Some plants from Table 2 have name and current uses very similar to those registered by Saint-Hilaire and could be identified as *Eremanthus erythropappus* (DC) MacLeish (candeinha, Asteraceae), *Vellozia squamata* Pohl. (canella d’ema, Velloziaceae), *Petiveria alliacea* L. (ghine, Phytolacaceae) and *Myrcia cauliflora* (Mart.) O.Berg (jaboticaba, Myrtaceae) (Lorenzi and Matos, 2002; Brandão, 2010). Some traditional uses could not be translated from French and are described in Table 1 in their original format e.g., “gallico”



**Table 2**  
Traditional uses for plants not identified.

Traditional use	Vernacular names
Aphrodisiac	Cravo/Composée [B1-1896]
Ailments of the mouth and throat	Banana do brejo [D-697]; Folha da Serra [B1-1574]; Sangue de Boi/ <i>Bauhinia</i> [B1-715; B1-734]; Marmelo do Sertão [B1-777]
Aromatic, pleasant odour	Alfavaca da Costa [B1-1415], Angélica do Matto Rubiacée, <i>Guettarda</i> [A1-673], Candeinha/Composée [B1-1989 <sup>bis</sup> ], Canella vermelha/Lauracée [C1-353]; Chá de bode, chá de cabrito, chá do matto, chá de Semedo/ <i>Lantana</i> [D 29]; Cipó dalho/ <i>Bignonia</i> [B1-666]; Cravo/Composée [B1-1896]; Almeciga/ <i>Corymbifera</i> [A1-230]; Herva do Lagadisso do sertão, <i>Spongia/Mimosa</i> , <i>Spongia</i> [B1-1836]; Unha de gato/ <i>Mimosa</i> [B2-2223]
Diuretic	Congonha [B2-2170 <sup>bis</sup> ]; Japacanga, Vulnerária [A1-616; B1-1036; D600]; Migeira, Mijadeira/Boraginacée [B1-1037; B2-2471 <sup>bis</sup> ]; Três folhas/ <i>Ononis/Rutacée</i> [B1-747]; Cainana, Dambre/Composée [A1-224]
Edible fruits, food, good taste	Amora branca [D-466], Andorinha, Fruta da Serra/Ericacée [D-221 <sup>bis</sup> ], Baburanas [B1-933], Banana do brejo [D-697], Borulê/Urticacée [B1-1806]; Fruta de ema [C1-859 <sup>bis</sup> ]; Jaboticaba [B1-1456]; Juá/ <i>Solanum</i> [see A1-508]; Juquiri/ <i>Solanacée</i> [C1-468]; Herva de São Thome [B1-1039]; Hombu [B1-1873]; Inga pichirico/Melastomatacée [C1-856]; Luiricuri [B1-1842]; Marmelade [B1-1928 <sup>bis</sup> ]; Muzambé [B1-1830]; Olho de moça/Boraginacée [B1-934]; Pao doce/ <i>Vochysiaceae</i> [D-313; C1-502]; Pindoba/Leguminosae [C1-867]
Emetic	Poalha, Poalha de capoeira/Rubiaceae [C1-213; D-363]; Poalha/ <i>Polygala</i> [C1-767]
Emmenagogue	Capicirica/Melastomatacée [A1-619]
Fevers	Chapadinha/Leguminosae [C1-611-11]; Chapadinha/Gentianée [D-466-ter]; Cruzeiro [A1-199]; Para tudo/pau de lei [B1-527]; Parerinha, Sete sangrias/Composée [C1-962 <sup>bis</sup> ]; Sete Sangrias/Euphorbiacée [C1-8835 <sup>5</sup> ]; Unha d'anta/Leguminosae [B1-1273; B1-1870 <sup>4</sup> ]
Good for “gallico”	Galuina, Gravata [B1-1296]; Salva [B1-1255; C1-451]; Salsa do campo/Rubiée [C1-611 <sup>ter</sup> ]
Indigestion	Chá de Príncipe/Labiatacée [C1-664 <sup>ter</sup> ]; Chá do campo/Composée [C1-205]
Ink, dye, tincture	Andorinha, Fruta da Serra/Ericacée [D-221 <sup>bis</sup> ]; Caruru de leite [B1-1184]; Perseguido do matto, marmeleiro do matto/ <i>Cerasum</i> [C1-169; D-410]; Tacuma/Verbenacée [A1-496; A1-497]; Tinta de Caboco [B1-1573]
Pains, woman's cramps, abscesses and inflammations	Carrapixu rasteiro/ <i>Helisarum</i> [B1-1049]; Chá de Príncipe/Labiatacée [C1-664 <sup>ter</sup> ]; Ponta de lanceta/Composée [D-449 <sup>bis</sup> ]; Viudeira [D-449 <sup>4</sup> ]
Pillows, mattresses and for making baskets and spoons	Arvore de paina/ <i>Carolinia</i> [C1-120]; Canella D'Ema, Canella D'Hema [B1-514 <sup>ter</sup> ; B1-757; B1-781; B1-888; B1-900; B1-1339; B1-1970 <sup>bis</sup> ]; Perpétua sylvestre/Composée [A1-56]; Vupara/Salicariacée [B1-405]; Guaraná, Pau de Leite ou Pau de Colher [B1-523; B2-2209]
Poisonous	Braúna do campo [B1-724]; Espongira/ <i>Mimosa</i> [B1-1398]
Purgative	Capitão do matto/Cucurbitacée [B1-994]; Fruto do viado/Leguminosae [C1-575]; Poaya de marinico [B1-1393 <sup>ter</sup> ]; Ponta de lança/Apocynacée [B1-1399]; Taívia, Anna Pinta/Cucurbitacée [B1-1050]; Tauba [B1-803]; Tiú, raiz de tiú/Euphorbiacée [B1-1872]
Respiratory disorders	Samambaia do matto virgem [B1-1047]; Sete Sangrias/Rubiaceae, <i>Houstonia</i> [C1-134]
Rheumatism	Folha de anta, Erva de anta/Rubiaceae [C1-883 <sup>ter</sup> ]
Snake bites	Ghine [B1-945]; Hortelão do Brejo/Rubiaceae, <i>Spermacece</i> [B1-948]; Mandioca do Campo [D-410]; Palmeirinha/Indú [C1-196 <sup>ter</sup> ]
Stimulant	Coração de Jesus/Composée [D-445]
Timber; good for thatch	Canella preta/Lauracée [C1-190]; Catigua/Meliacée [C1-469]; Massaranduba/Urticacée [B2-328 <sup>bis</sup> ]; Para tudo/pau de lei [B1-527]; Sapé/Graminae [B2-2195]
Venereal diseases	Azogue do Brasil, Dambre [B1-1635], Batatinha [B1-758], Carapixu/Composée [D-449-5], Caroba/ <i>Bignonia</i> [B1-1841; C1-506]; Caroba grande/Bignoniacée [C1-611-10]
Viscous and foul odour; the cattle do not graze; not good to eat	Mata pasto do Matto, Grão de Gallo/ <i>Spermacece</i> , Rubiacée [B1-277; B1-1591 <sup>bis</sup> ]; Melancia do campo/Cucurbitacée [D-367]
Vulnerary, heal wounds	Almeciga/Composée [A1-223]; Casadinha/Composée [C1-601 <sup>ter</sup> ]; Crista de gallo [B1-1424 <sup>bis</sup> ]; Ghine [B1-945]; Mariana [D-811 <sup>ter</sup> ]; Sambuchina/ <i>Ruelia</i> [B1-1908]

(probably correlated with gall bladder), “*boubons*” or “*anostemes*”. The results of laboratory studies that correlated with the traditional uses were obtained from PubMed and are included in Table 1.

### 3. Results

A total of 283 plants were considered useful and denoted with “N.V.” or “Nom. Vulg.” by Saint-Hilaire in his field books. Of these, 165 (58.3%) were identified by their updated botanical names (Table 1). The identified species are distributed among 53 families, Fabaceae being the most strongly represented with 20 species. The Solanaceae, Rubiaceae, Myrtaceae, Annonaceae and Malvaceae represent 12, 10, 9, 8 and 7 species, respectively. Other well-represented families were Euphorbiaceae, Lamiaceae and Asteraceae, with six species each. The remaining families have 1 to 5 species each. Of all the species listed in Table 1, 40 were first described by A. de Saint-Hilaire. The families with the most species are Annonaceae, Rubiaceae, Sapindaceae, Euphorbiaceae and Malvaceae.

Data on some of the species from Table 1 were published by Saint-Hilaire in his books. The *Plantes usuelles des Brésiliens*

includes 34 species from Table 1 (marked with number 4a in Table 1), *Histoire des plantes les plus remarquables du Brésil et Paraguay* includes 13 (4b) and *Flora Brasiliæ Meridionalis* includes 34 (4c). Data about another 58 species can be found in his travel diaries (4d). The species with the most published data was *Ticorea jasminiflora* var. *febrifuga* A.St.-Hil. (Rutaceae), for which different data can be found in the four consulted bibliographies. The *Annona* spp. (Annonaceae), *K. speciosa* A.St.-Hil. (Clusiaceae), *G. ulmifolia* Lam. (Malvaceae), *S. esculentus* A.St.-Hil. (Sapindaceae), *H. poaya* (A.St.-Hil.) Baill. (Violaceae) and *D. brasiliensis* (A.St.-Hil.) Miers (Winteraceae) were each published in three books. Other species have been published in one or two books. In contrast, 75 species from Table 1 have not been published in any of A. de Saint-Hilaire's books.

Fifty-eight different traditional uses were recorded for the plants identified in Tables 1 and 2, and the most common uses were as purgatives (19 plants) and febrifuges (18). Other frequent traditional uses were treat venereal disease (12, two as anti-syphilitic and one to treat gonorrhoea), to alleviate pain (11 plants), treat snake bites (11), as well as for use as diuretics (10). It is apparent that Saint-Hilaire was concerned about recording the information about the uses of the plants accurately. For some species, for example, he wrote the information in the

field book in Portuguese, as for Carapixo rasteiro (*Helisarum*, B1-1049): “bom para banhos nas dores de cadeira” (“good in baths for back pain”) or for chá de príncipe (Labiateae, C1-664<sup>ter</sup>) decoction used in indigestion and “dor do lado” (“pain in side”). In some cases, the doses and formulas of remedies were carefully documented, as for Capitão do Mato (B1-994), for which it is recorded that “fruits are purgative; of the root should be placed in eau de vie for 9 day and to drink a cup every morning to treat venereal disease”. Another example was registered for Viudeira (D-449 4°): “mix the leaves with roots of vassourinha, fennel, a small amount of sugar and is taken for sharp pains on the side”. He also used the remedies himself, as documented for *Dorstenia brasiliensis* Lam. (Moraceae) as a febrifuge (Table 1). Peculiarities of Brazilian popular culture were carefully noted in the field books. He noted, for example, that *Euphorbia hyssopifolia* L. (Euphorbiaceae, Table 1) has the common name “Herva de Santa Luzia” due to the Catholic saint who was invoked for curing ophthalmia; “Roão de campo” (Apocynaceae, C1-328) was used to prevent spells (“feitiços”). In many cases he compares plants with other well-known species, such as Carqueja (*Baccharis genistelloides* (Lam.) Pers. subsp. *crispa* (Spreng.) Joch. Muell., B1-492, Asteraceae, Table 1) and Cruzeiro (A1-199, Table 2), whose bitterness and efficacy against fevers are comparable with Gentian (*Gentiana lutea* L.–Gentianaceae).

Some species from Table 1 have had their efficacies correlated with the recorded data from Saint-Hilaire confirmed by laboratory studies. Extracts from *Aristolochia cymbifera* Mart. & Zucc. (Aristolochiaceae), *Croton* spp. (Euphorbiaceae), *Hymenaea stigonocarpa* Mart. ex Hayne and *Swartia* sp. (both Fabaceae), *Urena lobata* L. (Malvaceae), *Piper* sp. (Piperaceae) and *Polygonum* spp. (Polygonaceae) have shown antimicrobial activity in vitro. Anti-inflammatory activities in vivo were observed for *Davilla elliptica* A.St.-Hil. (Dilleniaceae), *Jatropha elliptica* (Pohl) Oken (Euphorbiaceae), *Polygonum* spp. (Polygonaceae), *Casearia sylvestris* Sw. (Salicaceae) and *Drimys brasiliensis* (A.St.Hil.) Miers (Winteraceae). Other species were confirmed to have analgesic properties (*Achyrocline satureioides* (Lam.) DC–Asteraceae, *Piper umbellatum* L.–Piperaceae, *Casearia sylvestris* Sw.–Salicaceae and *Drimys brasiliensis* (A.St.-Hil.) Miers–Winteraceae), antihelmintic (*Andira fraxinifolia* Benth.—Fabaceae and *Polygonum* spp.—Polygonaceae), laxative for *Eugenia dysenterica* DC.—Myrtaceae and to treat gingival bleeding and dental plaque for *Piper* spp. (Piperaceae). The toxicity of some Rubiaceae was confirmed in many studies, as well as the ictiotoxic activity of *Serjania lethalis* A.St.-Hil. (Sapindaceae). Three species used as substitutes of quina (*Cinchona* spp., Rubiaceae) shown antimalarial activities in vitro and in vivo: *Strychnos pseudoquina* A.St.-Hil. (Loganiaceae), *Cissampelos ovalifolia* DC. (Menispermaceae) and *Remijia ferruginea* (A.St.-Hil.) DC. (Rubiaceae).

Several plants were registered in the field books as food, and fifteen of those were recorded as edible fruits (Tables 1 and 2). Sensory characteristics were carefully observed and registered by Saint-Hilaire including taste, odour, colour and texture. He found, for example, 16 bitter species, seven species that were characterised by their pleasant odour, and another seven that were characterised by their useful colour. Finally, four species were registered as astringents and thus useful in tannery. In addition to delicious edible fruits, he registered the unpalatable taste of others, such as *Eugenia puniceifolia* (Kunth) DC.–Myrtaceae, *Solanum americanum* Mill.–Solanaceae (Table 1) and melancia do campo (Table 2).

Another 53 vernacular names were registered in the field books without any reference to traditional uses (not included in Tables): Alcaçuss mirim, *Clitoria* [B1-725], Alfavaca de cobra [B1-1029], Amexero/Guttiferée [B1-1874], Apostemeira [B1-1394<sup>bis</sup>], Arroz barbado [B1 663], Bonita/*Alstromeria* [B1-1391], Buriti de Espinho/Palmaa [C1-(763), Cabessuda/Palmier [B1-1794], Caju/

Thérébintée [A2-15B], Capim do brejo ou capim de capivara/ Graminée [B1-388], Capim Melado em Minas Capim Gordura [A1-247], China [B1-696], Cipó de batatas/Euphorbiacée [A2-89B], Claraíba [B1-1816], Cipó de Espinho/Composée [C1-881<sup>bis</sup>], Ghine [B2-2207], Cruciuma [B1-3], Espinho de agulha do campo [B1-1637], Esporas/Melastomée [C1-462], Featos [B2-2208], Flor de quaresma, Melastomastée [B1-673], Flor de Tabagute [B1-1041], Jacaranda/Mimosa [B1-282], Japacanga/Dioscorée [B2-2229], Giucon de porco/Borraginaceae [B1-619], Herva de sangue/Euphorbée [B1-1824], Herva do Lagarto/Spermacoce [B1-722], Herva sacra [B1-1034], Iuseto [B1-1823], Mamona do matto/Euphorbiaceae [D-603], Paineira do campo/Malvacée [D-372], Palmito/Palmier [A1-576], Parera do brejo/Composée [C1-246], Pau de carvão [C1-841], Pau de formiga/Polygonée [C1-813], Pau de Pinguim/Croton [B2-2187; B2-2208<sup>ter</sup>], Pequi [B1-1938], Pitanga miúda/Myrtée [C1-859<sup>ter</sup>], Piúna/Ramnée [D-364], Quaresma pequena, Melastomée [B1-703], Rosa do campo/Malvacée [B1-1935<sup>ter</sup>], Rosa do matto/Malvacée [B1-1259], Sandaia, Sambaíba/Palmier [después B1-1319], Sapoera/Mimosa [B2-2207], Soita Cavallo branco/Mimosa [C1-143], Tacuarassu/*Bambusa* [B1-13], Tecuma, Cu do negro [B1-783], Tomba/Euphorbiacée [C1-229], Veludo/Rubiaceae [C1-489] and Xichixichi/Leguminosae [B1-1795<sup>bis</sup>].

The uses of some exotic species were also registered by Saint-Hilaire but are not considered in this study: artemisia (B1-1834, *Artemisia* sp., Asteraceae), to treat “women’s diseases”; cicuta (*Plumbago*, Plumbaginaceae, B1-1397), a vesicant that causes strong blistering; salva (*Salvia* sp., Lamiaceae), to treat stomach disorders; cálamo aromático (B1-1998<sup>bis</sup>, Cyperaceae), Rhuibarbo [B1-1999] and Pinhão de purga/*Jatropha* [A1-241], as purgatives. The tubers of the *Dioscorea mangareto* branco [B1-1055], mangareto roxo [B1-1056], cara cabeluda [C1-172<sup>ter</sup>], cara do campo or cara de cobra [D-335], Caratinga/Dioscorée [B1-1023] were eaten, as well as the seeds of guando (*Cajanus cajan* (L.) Hut., A1-103). Other recorded exotic species included endru sylvestre (B1-229, Umbelliferae), coentro da colonia (A1-640, *Eryngium*), *Thea* folha de mate [C1-101] and losna (C1-453, Asteraceae).

#### 4. Discussion

In this study, we present data regarding useful native plants found in the manuscripts (field books) of Auguste de Saint-Hilaire, regarding the flora of the provinces of Minas Gerais, Espírito Santo, Rio de Janeiro and Goiás. A total of 283 useful plants were recorded in the studied field books and this high number is certainly due to the places where he travelled, which were rich in biodiversity. In fact, only the province of Minas Gerais exhibited remarkable ecological diversity at that time. Four of Brazil’s six major biomes occur in Minas Gerais, with the Atlantic Forest in the east, savannahs (cerrado) in the west, Caatinga in the north, and *Araucaria* forests in the south. When Saint-Hilaire travelled there, the forest was still preserved and the cerrado unexplored, with a strong interaction between the Native American people and the more recently arrived inhabitants from agricultural areas. The locals assisted the visitants with locating and identifying plants by sharing the popular nomenclature and indicating the best regions for research (Moreira, 2002). Consequently, hundreds of useful plant species were documented.

The traditional use most frequently noted by Saint-Hilaire was as a purgative. These plants were widely used because, at that time, the local people had a belief that diseases were due to “dirty body” and that it was necessary to “purge” for cleansing. Plants used to treat snake bites and stomach disorders were also frequently mentioned by Saint-Hilaire in his field books. It is interesting to note that all species used to treat snake bites belong to the Euphorbiaceae (*Croton perdicipes*, *Jatropha elliptica* and

*Maprounea brasiliensis*, Table 1), which could be an indication of the presence of specific active substances within this plant family. Saint-Hilaire was also quite aware of the toxicity of the plants. The toxicity of *Chiococca* spp., *Palicourea marcgravii*, *Psychotria* spp. (Rubiaceae) and *Cestrum laevigatum* (Solanaceae) was confirmed in many studies, as well as the ictiotoxic activity of *Serjania lethalis* A. St.-Hil., Sapindaceae (Table 1). Despite performed only in vitro and pre-clinical, the studies show a indicative of the presence of active substances in these plants.

The plants used by Brazilians to solve the health problems that commonly afflicted humans in that time were given special attention. Fever, for example, was a common health problem and could result from various aetiologies. One of the most feared was the intermittent fever, showing typical symptoms of malaria, a disease caused by the *Plasmodium* parasite, which can lead to death. The medical cure for malaria originated in the 17th century when Spaniards learned, from the native Americans living in Peru the use of the bark from *Cinchona* spp., especially *C. succirubra* Pav. ex Klotzsch (Rubiaceae), and known as “china or quina”. These plants produced quinine, a potent antimalarial that is still in use to effectively treat cases when the parasite is resistant to the usual chemotherapies. Species of *Cinchona* do not occur in Brazil, but the traditional name of “quina” is given to many other medicinal plants, that are also used to treat fevers. Saint-Hilaire was responsible for the botanical description of many of these substitute species, such as *Strychnos pseudoquina* A.St.-Hil. (Loganiaceae), *Remijia ferruginea* A.St.-Hil. (Rubiaceae) and *Solanum pseudoquina* A.St.-Hil. (Solanaceae). These species were published in his book *Plantes usuelles des Brésiliens* (Saint-Hilaire, 1824a), but the first data about them was recorded in the field books (Table 1). The species *Baccharis genistelloides* (Lam.) Pers. subsp. *crispa* (Spreng) Joch. Muell. (Asteraceae), *Cissampelos ovalifolia* DC. (Menispermaceae) and *Galipea jasminiflora* (A.St.-Hil.) Engl. (Rutaceae) were also recorded as useful for treating intermittent fevers. Of these species, only *S. pseudoquina* and *R. ferruginea* and *C. ebracteata*/*C. ovalifolia* had their efficacy evaluated in laboratory studies (Table 1). Other species of “quina” not mentioned in the studied field books were also botanically described and published by Saint-Hilaire: *Bathysa cuspidata* (A.St.-Hil.) Hook.f. ex K.Schum. (Rubiaceae), *Hortia brasiliensis* A.St.-Hil. and *Evodia febrifuga* A.St.-Hil. (both Rutaceae, Saint-Hilaire, 1824a). Malaria remains one of the most serious diseases in tropical areas of the world, and it has infected millions of people. The species mentioned by Saint-Hilaire should be prioritised in studies about the efficacy of plant remedies for malaria.

Many substitutes for *Carapichea ipecacuanha* (Brot.) L.Anderson (poalha, poaya, or ipecacuanha, Rubiaceae) were also recorded by Saint-Hilaire in his field book, including *Richardia brasiliensis* Gomes and *R. scabra* L. (Rubiaceae) and *Hybanthus poaya* (A.St.-Hil.) Baill. (Violaceae). The *Carapichea ipecacuanha* is native to the Atlantic Forest and used for centuries by Native Americans for their antidiarrheal and emetic properties. The roots of this species were one of the most important products of Brazil in the 18th century, with about four tonnes transported annually from Rio de Janeiro to Portugal (Dean, 1996). Traditional uses of *C. ipecacuanha* as anti-diarrheal have been confirmed by several pharmacological studies, which have shown that the medicinal actions of this plant are a result of the presence of the alkaloids emetine and cephelina. These substances act specifically on *Entamoeba* parasites that cause diarrhoea, which were prevalent and often fatal at that time. Because of its importance in medicine, this species was included in the official lists of the pharmacopoeia of many countries and the World Health Organisation (WHO, 2007). No studies have been conducted to date to verify the pharmacological potential of the substitute species.

A wide variety of edible fruits was also recorded by Saint-Hilaire in his field books, including *Talisia esculenta* (Cambess.) Radlk. (pitomba, Sapindaceae), *Annona* spp. (araticum, Annonaceae), *Psidium* spp. (araçá, goiaba) *E. dysenterica* DC. (cagaiteira) and *P. cattleianum* Sabine (gabioba) all Myrtaceae, *Byrsonima* spp. (murici) Malpighiaceae, *H. speciosa* Gomes (mangaba) Apocynaceae, *Eugenia dysenterica* DC. (cagaiteira, Myrtaceae), *Psidium cattleianum* Sabine (gabioba, Myrtaceae) and *Hymenaea* spp. (jatobá, Fabaceae). He had great interest in these native plants, which he called “wild fruits”, and suggested that they must be further explored. However, the colonial Portuguese project did not have an interest in evaluating the potential of native products. In contrast, the Portuguese made efforts to acclimate plants introduced from other continents to Brazil since the earliest time of colonisation of the country (Nepomuceno, 2008). By the mid-sixteenth century, for example, Brazil witnessed the successful cultivation of cinnamon from Ceylon, pepper from Malabar, ginger from China, coconuts from Malaysia, mangos from Southeast Asia, jackfruit from India and cacao from Middle America (Ferrão, 2004; Voeks, 2004). This situation has changed, and today, many of these species, especially those from the cerrado, have gained acceptance and industrial technology. Several of them are marketed today in the form of juices, sweets, ice cream and candies. The nutritional value of some of these exotic fruits has been confirmed by several studies, but the potential of many others, including their toxicity, as in the case of *Solanum* species, is still unknown (Oliveira et al., 2012).

Very few exotic species were registered by Saint-Hilaire in his field books, which clearly showed a preference for native Brazilian species in use at that time. Currently, medicinal plants are still in use in both rural and urban areas of Southwest Brazil, but the local phytotherapy has become largely based on exotic plants such as chamomile (*Chamomilla recutita* (L.) Rauschert, Asteraceae), mint species, melissa (*Melissa officinalis* L., Lamiaceae) and other foreign species (Stehmann and Brandão, 1995; Begossi et al., 2002). This fact is a consequence of the intense miscegenation of cultures over recent centuries in Brazil: most plants are used according to folk tradition, which was brought to the country by Europeans and Africans, popularising European rather than indigenous medicine. Saint-Hilaire was also concerned about the possible disappearance of important useful native species caused by the intense process of deforestation that was already occurring at that time. He discussed the necessity of creating commissions to document and protect native knowledge about these plants (Saint-Hilaire, 1975a). Actually, in many of the places that he visited, the original vegetation no longer exists. The useful plants documented by Saint-Hilaire, as well as the traditional knowledge associated with them, run the risk of extinction.

Many of the species first named and described by Saint-Hilaire were included in the first edition of the Brazilian Official Pharmacopoeia, edited by the Brazilian Government in 1926 (Brandão et al., 2008). At that time, medicine preparation was based on vegetable extracts, and therefore, several native species were used in both traditional and conventional medicine. Some of such species as *Remijia ferruginea* A.St.-Hil. (Rubiaceae), *Strychnos pseudoquina* A.St.-Hil. (Loganiaceae), *Lantana pseudothea* (A.St.-Hil.) Schauer (Verbenaceae), *Anchietea pyrifolia* (Mart.) G.Don. (= *A. pyrifolia* A.St.-Hil., Violaceae) and *Zanthoxylum tingossuiba* A.St.-Hil. (Rutaceae) were recorded by him in his field book (Brandão et al., 2009). Many of these species were also used for decades by Brazilian laboratories for preparing medicine (Brandão et al., 2010). However, a rapid decline in the use of these plants in conventional medicine occurs, because there are no detailed laboratory studies that confirm the efficacy and safety of these plants.

In the present study, we presented a non-exhaustive list of Brazilian useful plants recorded by Saint-Hilaire in his field book. Half of the informations has never been published, neither by Saint-Hilaire. The plant use data was obtained from a primary source: the traditional information was collected at a time when when Brazil's native vegetation was still preserved and traditional medicine was practiced based on native plants. Few species have been investigated in detail through laboratory studies, but all of those thus far examined have had their traditional uses confirmed, showing the potential of these plants as source of new medicine. We suggest that the remaining species recorded by Saint-Hilaire be further explored, which would contribute to the conservation of biodiversity and Native American traditional heritage.

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## References

- Afolayan, A.J., Jimoh, F.O., 2008. Nutritional quality of some wild leafy vegetables in South Africa. *International Journal of Food Sciences and Nutrition* 59, 1–8.
- Alviano, W.S., Alviano, D.S., Diniz, C.G., Antoniolli, A.R., Alviano, C.S., Farias, L.M., Carvalho, M.A., Souza, M.M., Bolognese, A.M., 2008. In vitro antioxidant potential of medicinal plant extracts and their activities against oral bacteria based on Brazilian folk medicine. *Archives of Oral Biology* 53, 545–552.
- Andrade-Neto, V.F., Brandão, M.G.L., Stehmann, J.R., Oliveira, L.A., Krettli, A.U., 2003. Antimalarial activity of Cinchona-like plants used to treat fever and malaria in Brazil. *Journal of Ethnopharmacology* 7 (2–3), 253–256.
- Begossi, A., Hanazaki, N., Tamashiro, J.Y., 2002. Medicinal plants in the Atlantic Forest (Brazil): knowledge, use and conservation. *Human Ecology* 30 (3), 281–299.
- Bendaoud, H., Romdhane, M., Souchard, J.P., Cazaux, S., Bouajila, J., 2010. Chemical composition and anticancer and antioxidant activities of *Schinus molle* L. and *Schinus terebinthifolius* Raddi berries essential oils. *Journal of Food Science* 75, C466–C472.
- Bock, M.A., Sanchez-Pilcher, J., Ortiz, M., 1995. Selected nutritional and quality analyses of tomatillos (*Physalis ixocarpa*). *Plant Foods for Human Nutrition* 48, 127–133.
- Brandão, M.G.L., Diniz, B.G., Monte-Mór, R.L.M., 2004. Plantas medicinais: um saber ameaçado. *Ciência Hoje* 35, 64–66.
- Brandão, M.G.L., Zanetti, N.N.S., Oliveira, P., Grael, C.F., Santos, A.C., Monte-Mór, R.L.M., 2008. Brazilian medicinal plants described by 19th century European Naturalists and in Official Pharmacopoeia. *Journal of Ethnopharmacology* 120, 141–148.
- Brandão, M.G.L., Cosenza, G.P., Grael, C.F.F., Netto, N.L., Monte-Mór, R.L.M., 2009. Traditional uses of American plant species from the 1st edition of Brazilian Official pharmacopoeia. *Revista Brasileira de Farmacognosia* 19, 478–487.
- Brandão, M.G.L., Cosenza, G.P., Stanislaw, A.M., Fernandes, G.W., 2010. Influence of Brazilian herbal regulations on the use and conservation of native medicinal plants. *Environmental Monitoring and Assessment* 164, 369–377.
- Brandão, M.G.L., 2010. Plantas úteis de Minas Gerais, na obra dos naturalistas. Código, Belo Horizonte. (p. 120).
- Brandão, M.G.L., Grael, C.F.F., Fagg, C.W., 2011. European naturalists and medicinal plants of Brazil. In: Grillo, O., Venora, G. (Eds.), *Biological Diversity and Sustainable Resources Use*. Intech, Croatia, pp. 101–102.
- Bussmann, R.W., Malca-García, G., Glenn, A., Chait, G., Díaz, D., Pourmand, K., Jonat, B., Somogy, S., Guardado, G., Aguirre, C., Meyer, K., Kuhlman, A., Townesmith, A., Frías-Fernandez, F., Benito, M., 2010. Minimum inhibitory concentrations of medicinal plants used in Northern Peru as antibacterial remedies. *Journal of Ethnopharmacology* 132, 101–108.
- Caldeira, S.D., Hiane, P.A., Ramos, M.I.L., Ramos Filho, M.M., 2004. Caracterização físico-química do araçá (*Psidium guineense* Sw.) e do tarumã (*Vitex cymosa* Bert.) do estado de Mato Grosso do Sul/Physical-chemical characterization of Araça (*Psidium guineense* Sw.) and Tarumã (*Vitex cymosa* Bert.) of Mato Grosso do Sul State (Brazil). *Boletim do Centro de Pesquisa e Processamento de Alimentos* 22, 145–154.
- Carod-Artal, F.J., 2003. Neurological syndromes associated with the ingestion of plants and fungi with a toxic component (II). Hallucinogenic fungi and plants, mycotoxins and medicinal herbs. *Revista de Neurologia* 36, 951–960.
- Clerici, M.T.P.S., Carvalho-Silva, L.B., 2011. Nutritional bioactive compounds and technological aspects of minor fruits grown in Brazil. *Food Research International* 44, 1658–1670.
- Dean, W., 1996. *With Broadax and Firebrand: The Destruction of the Brazilian Atlantic Forest*. University of California Press, Berkeley. (p. 482).
- Del-Vechio-Vieira, G., Sousa, O.V., Miranda, M.A., Senna-Valle, L., Kaplan, M.A.C., 2009a. Analgesic and anti-inflammatory properties of essential oil from *Ageratum fastigiatum*. *Brazilian Archives Biology and Technology* 52, 1115–1121.
- Del-Vechio-Vieira, G., Sousa, O.V., Yamamoto, C.H., Kaplan, M.A.C., 2009b. Chemical composition and antimicrobial activity of the essential oils of *Ageratum fastigiatum* (Asteraceae). *Records of Natural Products* 3, 52–57.
- Desmachellier, C., 2010. Neotropics and natural ingredients for pharmaceuticals: why isn't South American Biodiversity on the crest of the wave? *Phytotherapy Research* 24, 791–799.
- Dwyer, J.D., 1955. The Botanical Catalogues of Auguste de St. Hilaire. *Annals of the Missouri Botanical Garden* 42, 153–170.
- El-Hashash, M.M., Abdel-Gawad, M.M., El-Sayed, M.M., Sabry, W.A., Abdel-Hameed, S.S., Eel-S., Abdel-Lateef, 2010. Antioxidant properties of methanolic extracts of the leaves of seven Egyptian *Cassia* species. *Acta Pharmaceutica* 60, 361–367.
- El-Massry, K.F., El-Ghorab, A.H., Shaaban, H.A., Shibamoto, T., 2009. Chemical compositions and antioxidant/antimicrobial activities of various samples prepared from *Schinus terebinthifolius* leaves cultivated in Egypt. *Journal of Agricultural and Food Chemistry* 57, 5265–5270.
- Esteves, I., Souza, I.R., Rodrigues, M., Cardoso, L.C., Santos, L.S., Sertie, J.A., Perazzo, F.F., Lima, L.M., Schneedorf, J.M., Bastos, J.K., Carvalho, J.C., 2005. Gastric antiulcer and anti-inflammatory activities of the essential oil from *Casearia sylvestris* Sw. *Journal of Ethnopharmacology* 101, 191–196.
- Ferrão, J.E.M., 2004. *A Aventura das Plantas e os Descobrimientos Portugueses*, 2<sup>nd</sup> ed. Instituto de Investigação Científica Tropical, Lisboa.
- Ferreira, A.R., 2002. *Viagem ao Brasil*, vols. I e II. Kapa Editorial, Rio de Janeiro.
- Fischer, D.C.H., Gualda, N.C.A., Bachiega, D., Carvalho, C.S., Lupo, F.N., Bonotto, S.V., Alves, M.O., Yogi, A., Di Santi, S.M., Avila, P.E., Kirchgatter, K., Moreno, P.R.H., 2004. In vitro screening for antiparasitic activity of isoquinoline alkaloids from Brazilian plant species. *Acta Tropica* 92, 261–266.
- Freyre, M.R., Baigorria, C.M., Rozycki, V.R., Bernardi, C.M., Charpentier, M., 2000. Suitability of wild underexploited vegetables from the Argentine Chaco as a food resource. *Archivos Latinoamericanos de Nutrición* 50, 394–399.
- Gazda, V., Gomes-Carneiro, M.R., Barbi, N.S., Paumgarten, F.J.R., 2006. Toxicological evaluation of an ethanolic extract from *Chiococca alba* roots. *Journal of Ethnopharmacology* 105, 187–195.
- Gomes, B.A., 1972. *Plantas Medicinais do Brasil*. Brasiliensia Documenta. Editora USP, São Paulo. (p. 226).
- Gonçalves, L.D., Almeida, H.R., Oliveira, P.M., Lopes, N.P., Turatti, I.C.C., Archanjo, F.C., Grael, C.F.F., 2011. Contribution for the phytochemical studies of *Ageratum fastigiatum*. *Revista Brasileira de Farmacognosia* 21, 936–942.
- Guimarães, M.M., Silva, M.S., 2008. Valor nutricional e características químicas e físicas de frutos de murici-passa (*Byrsonima verbascifolia*). *Ciência e Tecnologia de Alimentos* 28, 817–821.
- Gupta, R.K., Kesari, A.N., Watal, G., Murthy, P.S., Chandra, R., Tandon, V., 2005. Nutritional and hypoglycemic effect of fruit pulp of *Annona squamosa* in normal healthy and alloxan-induced diabetic rabbits. *Annals of Nutrition and Metabolism* 49, 407–413.
- Hashimoto, Y., Ishizone, H., Suganuma, M., Ogura, M., Nakatsu, K., Yoshioka, H., 1983. Periantrin I, a sweet triterpene-glycoside from *Periandra dulcis*. *Phytochemistry* 22, 259–264.
- Jayashankar, S., Panagoda, G.J., Amaratunga, E.A., Rajapakse, P.S., 2011. A randomised double-blind placebo-controlled study on the effects of a herbal toothpaste on gingival bleeding, oral hygiene and microbial variables. *Ceylon Medical Journal* 56, 5–9.
- Jimoh, F.O., Adedapo, A.A., Afolayan, A.J., 2010. Comparison of the nutritional value and biological activities of the acetone, methanol and water extracts of the leaves of *Solanum nigrum* and *Leonotis leonorus*. *Food and Chemical Toxicology* 48, 964–971.
- Kemmerling, W., 1996. Toxicity of *Palicourea marcgravi*: combined effects of fluoroacetate, N-methyltyramine and 2-methyltetrahydro-beta-carboline. *Zeitschrift für Naturforschung C* 51, 59–64.
- Kinupp, V.F., Barros, I.B.I., 2008. Teores de proteína e minerais de espécies nativas, potenciais hortícolas e frutas. *Ciência e Tecnologia de Alimentos* 28, 846–857.
- Kushima, H., Nishijima, C.M., Rodrigues, C.M., Rinaldo, D., Sassá, M.F., Bauab, T.M., Stasi, L.C., Carlos, I.Z., Brito, A.R., Vilegas, W., Hiruma-Lima, C.A., 2009. *Davilla elliptica* and *Davilla nitida*: gastroprotective, anti-inflammatory immunomodulatory and anti-*Helicobacter pylori* action. *Journal of Ethnopharmacology* 123, 430–438.
- Lago, J.H.G., Carvalho, L.A.C., da Silva, F.S., Toyama, D.O., Fávero, O.A., Romoff, P., 2010. Chemical composition and anti-inflammatory evaluation of essential oils from leaves and stem barks from *Drimys brasiliensis* Miers (Winteraceae). *Journal of Brazilian Chemical Society* 21, 1760–1765.
- Leite, I.B., 1996. *Antropologia da Viagem: escravos e libertos em Minas Gerais no século XIX*. Editora UFMG, Belo Horizonte.
- Léry, J.de, 1580. *Histoire d'un Voyage Faict en la Terre du Brésil*, 2eme edition Antoine Chuppin, Genève.



- Li, J.W.H., Vederas, J.C., 2009. Drug discovery and natural products: End of an era or an endless frontier? *Science* 325 (5937), 161–165.
- Lima, T.B., Silva, O.N., Oliveira, J.T., Vasconcelos, I.M., Scalabrini, F.B., Rocha, T.L., Grossi-de-Sá, M.F., Silva, L.P., Guadagnin, R.V., Quirino, B.F., Castro, C.F., Leonardecz, E., Franco, O.L., 2010. Identification of *Eugenia dysenterica* laxative peptide: a novel strategy in the treatment of chronic constipation and irritable bowel syndrome. *Peptides* 31, 1426–1433.
- Lorenzi, H.E., Matos, F.J., 2002. Plantas medicinais no Brasil/Nativas e exóticas. Instituto Plantarum, Nova Odessa. (p. 512).
- Machado, T.B., Leal, I.C., Kuster, R.M., Amaral, A.C., Kokis, V., Silva, M.G., Santos, K.R., 2005. Brazilian phytopharmaceuticals—evaluation against hospital bacteria. *Phytotherapy Research* 19 (6), 519–525.
- Magassouba, F.B., Diallo, A., Kouyaté, M., Mara, F., Mara, O., Bangoura, O., Camara, A., Traoré, S., Diallo, A.K., Zaoro, M., Lamah, K., Diallo, S., Camara, G., Traoré, S., Kéita, A., Camara, M.K., Barry, R., Kéita, S., Oularé, K., Barry, M.S., Donzo, M., Camara, K., Toté, K., Berghé, D.V., Totté, J., Pieters, L., Vlietinck, A.J., Baldé, A.M., 2007. Ethnobotanical survey and antibacterial activity of some plants used in Guinean traditional medicine. *Journal of Ethnopharmacology* 114, 44–53.
- Mak, W., Leung, S.Y., But, P.H., Ho, S.L., 1998. Toxic neuropathy following ingestion of self-collected herbs *Psychotria rubra*. *Neurological Journal of South East Asia* 3, 41–44.
- Marino, D.C., Sabino, L.Z., Armando Jr., J., Ruggiero, A.A., Moya, H.D., 2009. Analysis of the polyphenols content in medicinal plants based on the reduction of Cu(II)/bichinchoninic complexes. *Journal of Agricultural and Food Chemistry* 57, 11061–11066.
- Mattos, E.S., Frederico, M., Colle, T.D., Pieri, D.V., Peters, R.R., Piovezan, A.P., 2007. Evaluation of antinociceptive activity of *Casearia sylvestris* and possible mechanism of action. *Journal of Ethnopharmacology* 112, 1–6.
- Mayorga, H., Knapp, H., Winterhalter, P., Duque, C., 2001. Glycosidically bound flavor compounds of cape gooseberry (*Physalis peruviana* L.). *Journal of Agricultural and Food Chemistry* 49, 1904–1908.
- Mazumder, U.K., Gupta, M., Manikandan, L., Bhattacharya, S., 2001. Antibacterial activity of *Urena lobata* root. *Fitoterapia* 72, 927–929.
- Melo, J., de Sousa Araújo, T.A., de Almeida e Castro, V.T.N., Vasconcelos Cabral, D.L., Rodrigues, M.D., Carneiro do Nascimento, S., Cavalcanti de Amorim, E.L., de Albuquerque, U.P., 2010. Antiproliferative activity, antioxidant capacity and tannin content in plants of semi-arid northeastern Brazil. *Molecules* 15, 8534–8542.
- Moraes-Moreau, R.L., Haraguchi, M., Morita, H., Palermo-Neto, J., 1995. Chemical and biological demonstration of the presence of monofluoroacetate in the leaves of *Palicourea margravii* St. Hil. *Brazilian Journal of Medical and Biological Research* 28, 685–692.
- Moreira, I.C., 2002. O escravo do naturalista-o papel do conhecimento nativo nas viagens científicas do século 19. *31, 40–48* *Ciência Hoje* 31, 40–48.
- Muddathir, A.K., Balansard, G., Timon-David, P., Babadjamian, A., Yogoub, A.K., Julien, M.J., 1987. Anthelmintic properties of *Polygonum glabrum*. *Journal of Pharmacy and Pharmacology* 39, 296–300.
- Murcia, M.A., Jiménez, A.M., Martínez-Tomé, M., 2001. Evaluation of the antioxidant properties of Mediterranean and tropical fruits compared with common food additives. *Journal of Food Protection* 64, 2037–2046.
- Nepomuceno, R., 2008. O Jardim de D. João, 2<sup>a</sup> ed. Casa da Palavra, Rio de Janeiro.
- Newman, D.J., Cragg, G.M., 2012. Natural products as sources of new drugs over the 30 years from 1981 to 2010. *Journal of Natural Products* 75 (3), 311–335.
- Nogueira, R.C., Cerqueira, H., Soares, P., 2010. Patenting bioactive molecules from biodiversity: the Brazilian experience. *Expert Opinion in Therapeutic Patents* 20 (2), 1.
- Novais, T.S., Costa, J.F.O., David, J.P.L., David, J.M., Queiroz, L.P., França, F., Giulietti, A.M., Soares, B.P., Santos, R.R., 2003. Atividade antibacteriana em alguns extratos de vegetais do semi-árido brasileiro. *Revista Brasileira de Farmacognosia* 13 (Suppl. 2), 5–8.
- Oliveira, L.M., Bevilacqua, C.M., Macedo, I.T., Morais, S.M., Monteiro, M.V., Campello, C.C., Ribeiro, W.L., Batista, E.K., 2011. Effect of six tropical tanniferous plant extracts on larval exsheathment of *Haemonchus contortus*. *Revista Brasileira de Parasitologia Veterinária* 20, 155–160.
- Oliveira, V.P., Yamada, L.T., Fagg, C.W., Brandão, M.G.L., 2012. Native foods from Brazilian biodiversity as a source of bioactive compounds. *Food Research International* 48, 170–179.
- Peixoto, P.V., Brust, L.C., Duarte, M.D., Franca, T.N., Duarte, V.C., Barros, C.S., 2000. *Cestrum laevigatum* poisoning in goats in southeastern Brazil. *Veterinary & Human Toxicology* 42 (1), 13–14.
- Perazzo, F.F., Souza, G.H., Lopes, W., Cardoso, L.G., Carvalho, J.C., Nanayakkara, N.P., Bastos, J.K., 2005. Anti-inflammatory and analgesic properties of water-ethanolic extract from *Pothomorphe umbellata* (Piperaceae) aerial parts. *Journal of Ethnopharmacology* 99 (2), 215–220.
- Pereira, E.M., Gomes, R.T., Freire, N.R., Aguiar, E.G., Brandão, M.G., Santos, V.R., 2011. In vitro antimicrobial activity of Brazilian medicinal plant extracts against pathogenic microorganisms of interest to dentistry. *Planta Medica* 77, 401–404.
- Pereira, N.A., Jaccoud, R.J.S., Mors, W.B., 1996. Triaga Brasileira: renewed interest in a seventeenth-century panacea. *Toxicon* 34 (5), 511–516.
- Pisonis, G., 1648. *Historia naturalis et medicae Indiae Occidentalis*, 2<sup>nd</sup> ed. Ludovicus et Daniel Elzevier, Amsterdam. (p. 332).
- Razak, F.A., Othman, R.Y., Rahim, Z.H., 2006. The effect of *Piper betle* and *Psidium guajava* extracts on the cell-surface hydrophobicity of selected early settlers of dental plaque. *Journal of Oral Science* 48, 71–75.
- Rojas, R., Bustamante, B., Ventosilla, P., Fernández, I., Caviedes, L., Gilman, R.H., Lock, O., Hammond, G.B., 2006. Larvicidal, antimycobacterial and antifungal compounds from the bark of the Peruvian plant *Swartzia polyphylla* DC. *Chemical and Pharmaceutical Bulletin* 54, 278–279.
- Romanic-Neto, S., Pignal, M., 2010. *Herbário Virtual A. de Saint-Hilaire*. In: Absy, M.L., Matos, F.D.A., Amaral, I.L., orgs. *Diversidade Vegetal Brasileira: Conhecimento, Conservação e Uso*. Anais do 61 Congresso Nacional de Botânica, Manaus, INPA Ed.: pp. 205–209.
- Ruppelt, B.M., Pereira, E.F., Gonçalves, L.C., Pereira, N.A., 1991. Pharmacological screening of plants recommended by folk medicine as anti-snake venom—I. Analgesic and anti-inflammatory activities. *Memórias do Instituto Oswaldo Cruz* 86 (Suppl. 2), 203–205.
- Saint-Hilaire, A. de, 1824a. *Plantes usuelles des Brésiliens [Brazilian useful plants]*. Grimbart Libraire, Paris. (p. 340).
- Saint-Hilaire, A. de, 1824b. *Histoire des plantes les plus remarquables du Brésil et du Paraguay*. Chez A. Belin, Imprimeur Libraire, Paris. p. 279.
- Saint-Hilaire, A. de, Jussieu, A. de, Cambessedes, J., 1825–1833. *Flora Brasiliica Meridionalis*, vol. 3. Belin Bibliopolium, Paris.
- Saint-Hilaire, A. de, 1975a. *Viagem pelo distrito dos diamantes e litoral do Brasil*. Ed. Itatiaia, Belo Horizonte, EDUSP, São Paulo. p. 238.
- Saint-Hilaire, A. de, 1975b. *Viagem às nascentes do Rio São Francisco*. Ed. Itatiaia, Belo Horizonte, EDUSP, São Paulo. p. 192.
- Saint-Hilaire, A. de, 1975c. *Viagem ao Espírito Santo e Rio Doce*. Ed. Itatiaia, Belo Horizonte, EDUSP, São Paulo. p. 122.
- Saint-Hilaire, A. de, 1975d. *Viagem pelas províncias do Rio de Janeiro e Minas Gerais*. Ed. Itatiaia, Belo Horizonte, EDUSP, São Paulo. p. 382.
- Saint-Hilaire, A. de, 2009. *Plantas Usuais dos Brasileiros*. Código/DATAPLANT. Belo Horizonte. (p. 392).
- Saint-Hilaire, A. de, 2011a. *Quadro Geográfico da Vegetação Primitiva de Minas Gerais*. Fino Traço, Belo Horizonte. (p. 54).
- Saint-Hilaire, A. de, 2011b. *História das Plantas mais notáveis do Brasil e do Paraguai*. Fino Traço, Belo Horizonte. (p. 3720).
- Sallam, S.M., Abdelgaleil, S.A., Bueno, I.C., Nasser, M.E., Araujo, R.C., Abdalla, A.L., 2011. Effect of some essential oils on in vitro methane emission. *Archives of Animal Nutrition* 65, 203–214.
- Santos, S.C., Costa, W.F., Ribeiro, J.P., Guimarães, D.O., Ferri, P.H., Ferreira, H.D., Seraphin, J.C., 2002. Tannin composition of barbatimão species. *Fitoterapia* 73, 292–299.
- Sawyer, D., 2008. Climate change, biofuels and eco-social impacts in the Brazilian Amazon and Cerrado. *Philosophical Transactions of the Royal Society B* 363, 1747–1752.
- Shanley, P., Luz, L., 2003. The impacts of forest degradation on medicinal plant use and implications for health care in eastern Amazonia. *BioScience* 53, 573–584.
- Silva, S.C., Borba, H.R., Bonfim, T.C.B., Carvalho, M.G., Cavalcanti, H.L., Barbosa, C.G., 2003. Ação anti-helmíntica de extratos brutos de *Andira anthelmintica* (Vell.) Macbr. e *Andira fraxinifolia* Benth., em camundongos naturalmente infectados por *Vampirolepis nana* e *Aspiculuris tetraptera*. *Parasitologia Latinoamericana* 58, 23–29.
- Simões, C.M., Schenkel, E.P., Bauer, L., Langeloh, A., 1988. Pharmacological investigations on *Achyrocline satureioides* (LAM.) DC., Compositae. *Journal of Ethnopharmacology* 22, 281–293.
- Singh, B., Pandey, V.B., Joshi, V.K., Gambhir, S.S., 1987. Anti-inflammatory studies on *Polygonum glabrum*. *Journal of Ethnopharmacology* 19, 255–267.
- Souza, G.S., 1938. *Tratado Descritivo do Brasil em 1587*, 3rd ed. Companhia Editora Nacional, São Paulo, Rio de Janeiro, Recife, Porto Alegre. (p. 493).
- Steele, J.C.P., Phelps, R.J., Simmonds, M.S., Warhurst, D.C., Meyer, D.J., 2002. Two novel assays for the detection of haemin-binding properties of antimalarials evaluated with compounds isolated from medicinal plants. *Journal of Anti-microbial Chemotherapy* 50, 25–31.
- Stehmann, J.R., Brandão, M.G.L., 1995. Medicinal plants from Lavras Novas, Minas Gerais, Brazil. *Fitoterapia* 66, 515–520.
- Stellfeld, C., 1952. *Os dois Vellozos*. Gráfica Editora Souza, Rio de Janeiro. (p. 267).
- Suttisri, R., Chung, M.S., Kinghorn, A.D., Sticher, O., Hashimoto, Y., 1993. Periandrin V, a further sweet triterpene glycoside from *Periandra dulcis*. *Phytochemistry* 34, 405–408.
- Teixeira, J.R., Lapa, A.J., Souccar, C., Valle, J.R., 1984. Timbós: ichthyotoxic plants used by Brazilian Indians. *Journal of Ethnopharmacology* 10, 311–318.
- Thévet, A., 1557. *Les singularitez de la France antarctique, autrement nommée Amérique, de plusieurs terres et isles découvertes de nostre temps*. Maurice de la Porte, Paris.
- Trebiën, H.A., Neves, P.C.A., Yunes, R.A., Calixto, J.B., 1988. Evaluation of pharmacological activity of a crude hydroalcoholic extract from *Jatropha elliptica*. *Phytotherapy Research* 2, 115–118.
- Van der Lugt, J.J., Nel, P.W., Kitching, J.P., 1991. The pathology of *Cestrum laevigatum* (Schld.) poisoning in cattle. *Onderstepoort Journal Veterinary Research* 58, 211–221.
- Vellozo, J.M.C., 1961. *Flora Fluminense*. Documentos. Ministério da Justiça e Negócios interiores. Arquivo Nacional, Rio de Janeiro. (p. 397).
- Voeks, R.A., 2004. Disturbance pharmacopoeias: medicine and myth from the humid tropics. *Annals of the Association of American Geographers* 94, 868–888.
- World Health Organisation, 2007. *Selected Monographs for Medicinal Plants*, vol. 3. WHO, Genève.