

Medicinal Plants Prescribed in the Hospital of the São Bento Monastery between 1823 and 1824 in Olinda – Northeastern Brazil

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Abstract: Given the high importance of historical documental sources to better understand the dynamics of current pharmacopoeias, this work investigated the prescription book of the hospital of São Bento Monastery in Olinda (Northeastern Brazil) written by the physician Joaquim Jerônimo Serpa for the years of 1823 and 1824. The main aims of the work were to identify the medicinal plants used in formulations, identify the similarity among prescribed species within these years, access the proportion of plant-based medicines in the prescriptions and to access the contribution of species from the Americas in the formulations. A total of 63.8% of prescriptions had one or more plant species. We found 41 plant species in the prescriptions, most of them being exotic although native species were getting importance in the period. The most cited species were *Papaver somniferum* L., *Rheum officinale* Baill., *Psychotria ipecacuanha* (Brot.) Stokes, *Cinchona* sp. and *Guaiacum officinale* L. The similarity between the years was slow (46.5%), because of an increase in the number of prescribed species for the year of 1824. The importance of plants for the medicine at that time was elucidated, but, regarding native species, it is necessary to find out which factors influenced the incorporation of American plants on the official medicine.

Keywords: Historical ethnobotany, past pharmacopoeias, 19th century.

INTRODUCTION

Written documents are historical evidences which call researchers' interest on investigating different aspects of the inter-relation established between human societies and plants [1]. From this perspective historical Ethnobotany seeks, for example, to search information that is deposited in documents that talk about past centuries therapeutic practices. By deciphering and interpreting the documents' contents, researchers which dedicate to this study can provide data about the employment of medicinal plants as advocated in a past experience. Therefore, past information which is currently made available can be the starting point for the establishment of research projects that aim to develop new medicines [2].

Historical Ethnobotany works that are directed to alternative medicine can have the so-called prescription books as a research source. These are written documents which introduce to the reader some aspects of the medicine that was practiced a given period [3-7].

During the 19th century, one of the main places that gave medical assistance to local populations in Northeastern Brazil was the São Bento Monastery (in the town of Olinda, the State of Pernambuco, Northeastern Brazil) (Fig. 1). This monastery was responsible for sheltering sick people and elaborating prescription books, from which some medicines were prescribed to help treat the most diverse health problems of the period.

The inception of this Monastery in Olinda is attributed to Portuguese Benedictine monks, who arrived in Olinda, the former capital of Pernambuco, in 1590 or 1592 [8, 9]. In 1597, the monks acquired the terrain where the monastery is currently placed and started to build it for the further installation of monks in 1599 [10]. However, the monastery was ransacked and almost turned into ruins when the Dutch invaded Pernambuco in 1630. Following expulsion of the Dutch, the monastery began to be rebuilt in 1654 [9]. The first references to the hospital located in the monastery, known as a ward, date from 1796 [9], when the monks in Olinda started to construct it beside the monastery [11]. In the beginning, the main function of the hospital was to attend sick monks and slaves that worked in their farms and sugar mills, such as Musserepe and Tapará. Nevertheless, at the end of the 18th century, the hospital played an important role by attending to the population in general, given the poor quality of the other hospitals in Pernambuco (NE, Brazil) in that period [9, 11]. In 1814, the priests of the monastery council hired the services of the physician and surgeon-major Joaquim Jerônimo Serpa (1773-1842), a famous Brazilian surgeon due to his expertise not only in the field of medicine but also in the natural sciences, since he was the director of the Olinda Botanical Garden and an agronomy professor. He was also dedicated to the fields of philosophy, theology, linguistics, drawing, ethics and politics [12]. Arrested during the 1817 revolution in Pernambuco, Serpa returned to his activities in the monastery in 1821 and began to write the monastery's prescription book in 1823 [11].

This prescription book is a rich catalogue of the use of exotic and native plants employed in healing proceedings in the period between 1823 and 1829. It can be considered as a reference text about medicinal plants used during the 19th century in Olinda and adjacent regions, given that the

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Fig. (1). Localization of the São Bento Monastery in Olinda – Northeastern Brazil (A – Brazil; B – State of Pernambuco; C – São Bento Monastery).

monastery's hospital had an important role in attending to the needs of the public, which was even greater when epidemics disseminated in Pernambuco [12]. The prescription book contained formulations with synthetic products as well as products with animal, mineral and plant origins. Given that it is a valuable source of information about medicinal plant use in Pernambuco (Northeastern Brazil), this study aimed to 1. identify the medicinal plants used in formulations from the prescription book of the hospital of the São Bento Monastery in Olinda during the first years of documentation (1823 and 1824); 2. identify similarities among the prescribed species within this period; 3. assess the proportion of plant-based medicines in the prescriptions and 4. identify the biogeographical origin of these plants to

assess the contribution of species from the Americas in the formulations.

METHODS

Prescription Book of the Hospital of the São Bento Monastery and Historical Contextualization

To perform this investigation, the source document used was the prescription book of the physician and surgeon-major Joaquim Jerônimo Serpa for the hospital of the São Bento Monastery in Olinda between 1823 and 1824. The information used for our work came from a study performed by Schmalz [12]. This author made a historical research

about Serpa's professional life and in his work the prescriptions of Serpa's original document are transcribed. The prescription book gives information about remedy's preparations in which plants and other compounds are applied. However, these prescriptions don't bring the therapeutic indications and that is why our study focus only on species and not on diseases. Although the prescription book covers the whole period between 1823 and 1829, the research was limited to 1823 and 1824, because these were the first two years of documentation and Brazil faced a peculiar historical situation during that time. During 1823 and 1824, Brazil had recently gained independence from Portugal and was a monarchy governed by Pedro II. In Pernambuco, the atmosphere at that time was very disturbed, due to the recent end of the 1817 revolution in Pernambuco, which lasted 74 days and ended colonialism in the province of Pernambuco and also the neighboring provinces of Alagoas, Paraíba, Rio Grande do Norte and Ceará [13]. In 1820, a revolt inspired in the Portuguese liberal movement was repressed. On this occasion, a military from Pernambuco revolted against absolutism and created a government in 1824, when another revolution led by Pernambuco began: the "Confederação do Equador."

By that time, the leaders of the revolution sought to create a new constitution with a republican and liberal character and to ban slavery. Such opposition to the government of Pedro I was due to the regional economic crisis, the tributary taxes imposed by the government and the centralized governing policies.

These social and political convulsions that affected not only Pernambuco, but the whole country, emphasized the disaggregated colonial inheritance and the lack of internal cohesion in the country. Therefore, the provinces resisted to the strength of the central power, what brought effects in different spheres. In this scenario of complexity in the juridical, financial and administrative organization, issues concerning health practices were also affected. By that time it could be observed a "redefinition of what were the therapeutic practices legitimated by the government" [14, p. 68], and this discussion accompanied by a process of medicine institutionalization. Therefore, there was a dynamic scenario in the temporal cut-off of the document which is focus of our research.

Data Analysis

To analyze the prescription book, the proportion of medicinal plant-based prescriptions was recorded to assess the importance of plants in the medicine at that time. A cross-comparison was performed between the plant vernacular used in the prescription book and the possible scientific names (taxonomic clues), using www.botanical.com as the main database [14] and www.plantasmed.com.br as a secondary database (when no information about the plant could be found in the main database). The species names were updated according to the Missouri Botanical Garden database (www.tropicos.org) and the author's names followed Brumitt and Powell [15].

The species were classified according to their origin as (a) native to the Americas or (b) exotic as a way to indicate the rate of incorporation of American plants in the pharma-

copoeia of the period. Additionally, the G test [16] was used to compare the proportion of native and exotic species between the years. Similarity between plant occurrences in the years was calculated with the Jaccard similarity coefficient. To observe the most used species in the prescriptions, the species' frequency of occurrence was calculated by dividing the number of prescriptions in which they occurred by the total number of species. Any annual variation in frequencies of the most important species was also determined. Statistical analysis were performed with the software BioEstat 5.0 [17].

RESULTS AND DISCUSSION

When analyzing data from 1823 and 1824 referring to medicinal plant use in the hospital of the São Bento Monastery according to the registers of Dr. Joaquim J. Serpa, a total of 43 species were found in the prescriptions, belonging to 38 genera and 17 families, in addition to 1 species that was not identified (Table 1). The families with the highest number of species were Lauraceae (4 spp.), Asteraceae, Fabaceae, Lamiaceae and Convolvulaceae (3 spp. each). Asteraceae, Fabaceae and Lamiaceae are outstanding for their importance in current pharmacopoeias of many regions of the world [18, 19].

The crossing of information concerning evolutive characteristics of plant groups with data about their medicinal and edible potential has evidenced Asteraceae and Lamiaceae as the most derived groups and with the a high medicinal potential [20]. These are also among the families which have a higher number of species with some medicinal application in the Americas [21]. Asteraceae and Lamiaceae call attention of many researchers which have evidenced many of their activities, for example, the antibacterial and anti-inflammatory. [22-26]. Additionally, together with Fabaceae, these families have a wide distribution, especially in anthropogenic areas [27, 28]. This fact can help them playing a relevant role in local therapeutic systems.

The prescription book had a total of 42 prescriptions for 1823 and 99 prescriptions for 1824. For the two-year period, 63.8% of the prescriptions were composed of one or more plant species. This high frequency of plant use in the medical system reveals the great importance of plants for the pharmacopoeia of that period.

Other non-plant products were also present, but in lower frequencies in the prescriptions, and they mainly had synthetic (e.g., *Bálsamo d'arceo*), mineral (e.g., *calomelanoz*, *ethiope mineral*) and animal (e.g., *olhoz de caranguejoz*, *castorio*) origins.

Since there were a higher number of prescriptions for 1824, this year had also the highest number of prescribed plant species (39), while in 1823 there were only 22 prescribed plants. The similarity between the years was relatively slow (41.86%), mainly because a higher number of species were prescribed in 1824. We found no evidence or record that would indicate a reason for such an increase.

The vast majority of species cited in the prescriptions were not native to the Americas (79.07%). This result indicates that, for the context of plant use in the São Bento Monastery, native plants did not play an important role,

Table 1. Plant Species in the Prescription Book of Dr. Joaquim Jerônimo Serpa for the São Bento Monastery (Olinda, Pernambuco, Northeastern Brazil) in the Years of 1823 and 1824

FAMILY / Scientific name	Vernacular name	Status
APIACEAE		
<i>Conium maculatum</i> L.	Cicuta	Exotic
ARISTOLOCHIACEAE		
<i>Aristolochia serpentaria</i> L.	Serpentaria de Virgínia	Exotic
ASTERACEAE		
<i>Achillea millefolium</i> L.	Mil flores	Exotic
<i>Anacyclus aureus</i> Lam. ex DC.	Macella	Exotic
<i>Taraxacum officinale</i> F.H. Wigg.	Taraxaco	Exotic
BURSERACEAE		
<i>Commiphora myrrha</i> (T. Nees) Engl.	Mirrha	Exotic
CAPRIFOLIACEAE		
<i>Sambucus nigra</i> L.	Sabugueiro	Exotic
CENTRARIACEAE		
<i>Centraria islandica</i> L.	Musgo islandico	Exotic
CLUSIACEAE		
<i>Hypericum perforatum</i> L.	Óleo de Aparício	Exotic
CONVOLVULACEAE		
<i>Convolvulus scammonia</i> L.	Escamonia	Exotic
<i>Cuscuta racemosa</i> Humb.	Hera de chumbo	Native
<i>Exogonium purga</i> (Wender.) Benth.	Jalapa	Exotic
EUPHORBIACEAE		
<i>Croton eluteria</i> Benn.	Cascarilla	Exotic
FABACEAE		
<i>Astragalus verus</i> DC. ex Bunge	Goma alcatira	Native
<i>Myroxylon pereirae</i> (Royle) Klotzsch	Bálsamo peruviano	Native
<i>Glycyrrhiza glabra</i> L.	Alcasúz	Exotic
FUMARIACEAE		
<i>Fumaria officinalis</i> L.	Fumaria	Exotic
GENTIANACEAE		
<i>Gentiana lutea</i> L.	Genciana	Exotic
LAMIACEAE		
<i>Glechoma hederacea</i> L.	Hera terrestre	Exotic
<i>Lavandula angustifolia</i> Mill.	Alfazema	Exotic
<i>Mentha x piperita</i> L.	Hortelã de pimenta	Exotic
LAURACEAE		
<i>Cinnamomum verum</i> J. Presl e <i>Cinnamomum cassia</i> (L.) C. Presl	Canela espirituosa	Exotic
<i>Cinnamomum camphora</i> (L.) J. Presl	Cânfora	Exotic
<i>Sassafras albidum</i> (Nutt.) Nees	Sassafráz	Exotic
LILIACEAE		
<i>Scilla maritima</i> L.	Scilla	Exotic
PAPAVERACEAE		
<i>Papaver somniferum</i> L.	Ópio	Exotic
PINACEAE		
<i>Picea abies</i> (L.) H. Karst.	Borgonha	Exotic
POACEAE		
<i>Hordeum vulgare</i> L.	Cevada contuza	Exotic

(Table 1) Contd.....

FAMILY / Scientific name	Vernacular name	Status
POLYGONACEAE		
<i>Rheum officinale</i> Baill.	Ruibarbo	Exotic
RHANUCULACEAE		
<i>Paeonia officinalis</i> L.	Pionia	Exotic
ROSACEAE		
<i>Potentilla tomentilla</i> Schrank	Tomentilla	Exotic
<i>Rosa gallica</i> L.	Alexandria	Exotic
RUBIACEAE		
<i>Psychotria ipecacuanha</i> (Brot.) Stokes	Ipecacuanha	Native
<i>Cinchona</i> sp.	Casca peruviana, Quina	Native
SIMAROUBACEAE		
<i>Quassia amara</i> L.	Quassia	Native
SMILACACEAE		
<i>Smilax longifolia</i> Rich. e <i>Smilax syphilitica</i> Humb. & Bonpl. ex Willd.	Salsa parilla	Native
VALERIANACEAE		
<i>Valeriana officinalis</i> L.	Valeriana	Exotic
VIOLACEAE		
<i>Viola odorata</i> L.	Viola	Exotic
ZYGOPHYLLACEAE		
<i>Guaiacum officinale</i> L.	Guaiaco	Exotic
INDETERMINATE		
Not identified	Cypo	Native

although literature reports an increasing interest in the use of native plants for Brazilian medical practices of the 17th, 18th and 19th centuries [11, 29]. Cunha [11] affirms that, due to the delay for medicines that came from Europe and the deteriorated condition in which they arrived in Brazil, physicists and pharmacists were driven to use Brazilian medicinal flora, whose therapeutic properties had been discovered by the indigenous people and communicated to the Jesuit priests. The comparison between the two years did not show significant differences regarding the proportion of native and exotic species ($p < 0.05$), what indicates that, regardless of the great difference in the total species number between the years, there were no great increase or loss in the proportion of native species.

The five most frequently used species in the prescriptions were *Papaver somniferum* L. (present in 12.1% of the prescriptions), *Rheum officinale* Baill. (9.9%), *Psychotria ipecacuanha* (Brot.) Stokes (9.2%), *Cinchona* sp. and *Guaiacum officinale* L. (5%). Among them, two were native to the Americas (*P. ipecacuanha* and *Cinchona* sp.).

According to Schmalz [12], *P. ipecacuanha* had an “almost universal application” for Serpa, as he attributed to the plant a wide healing potential. Loureiro [30] refers to the species as one of the most important medicinal plants of the period, because it was part of most prescriptions and it was also indicated for almost all diseases which were common for that 19th century society. When visiting Serpa in 1837, Gardner [31] reported his admiration for *P. ipecacuanha*. In that occasion, the British botanical George Gardner affirms

that *P. ipecacuanha* roots were an importation product from Pernambuco. Therefore, this species was present in European medical practices since the 18th century [32].

CONCLUSION

It is extremely important to access documental sources that record knowledge and use of plants in this historical period marked by intense social modifications in the state of Pernambuco. Only with the understanding about plant knowledge and use in past times it will be possible to understand the formation process of Brazilian pharmacopoeia. Since physicians' and pharmacists' formation was normally performed in Portugal until the end of the 19th century, it is believed that this academic school has preferences for the use of exotic plants. Regarding the incorporation of native elements in the formulation of medicinal preparations, it is necessary to understand which events were influenced the insertion of native plants during the medical treatments of the 19th century, whether it was due to native product acquisition facilities, to fill blanks that were not covered by plants from the official pharmacopoeia or for some other reasons that still need to be elucidated. This way, the information presented here represent a step forward the understanding of this dynamic in the use of plant species, including the changing processes of plant use. Therefore, we suggest that further studies consider comparing past medicinal plant uses to the current ones in a given region, in order to better understand this plant use dynamics.

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REFERENCES

- [1] Medeiros MFT. Etnobotânica histórica: princípios e procedimentos. Recife: NUPEEA/ Sociedade Brasileira de Etnobiologia e Etnoecologia 2009.
- [2] Institute for preservation of medical traditions. Available in: <http://medicaltraditions.org/>
- [3] Pardo-de-Santayana M, Tardio J, Heinrich M, Touwaide A, Morales R. Plants in the works of Cervantes. *Econ Bot* 2006; 60: 159-81.
- [4] Medeiros MFT, Senna-Valle L, Andreato RHP. Figs na farmácia do Mosteiro de São Bento, Rio de Janeiro, século XIX. *Albertoa, Série Urticineae (Urticales)* 2006; 27: 189-92.
- [5] Medeiros MFT, Senna-Valle L, Andreato RHP. Histórico e o uso da "salsa parrilha" (*Smilax* spp.) pelos boticários no Mosteiro de São Bento. *Revista Brasileira de Biociências* 2007; 5: 27-9.
- [6] Almeida AV, Luna PDC, Santana TH, Lima VR. As plantas medicinais referenciadas pelo cirurgião e naturalista pernambucano Joaquim Jerônimo Serpa (1773-1842): uma ponte entre o passado e a atualidade. *Sitientibus, Série Ciências Biológicas* 2008; 8: 103-12.
- [7] Pollio A, De Natale A, Appetiti E, Touwaide A. Continuity and change in the Mediterranean medical tradition: *Ruta* spp. (rutaceae) in Hippocratic medicine and present practices. *J Ethnopharmacol* 2008; 116: 469-82.
- [8] Anunciação MA. *Chronica do Mosteiro de São Bento de Olinda até 1763*. Revista do Instituto Arqueológico e Geográfico Pernambucano 1937; 35: 18-9.
- [9] Mello JAG. O mosteiro de São Bento e seus cronistas. In: *Benedittinos de Olinda: 400 anos*. Recife: SANBRA 1986.
- [10] Luna JG. Os Monges beneditinos no Brasil – esboço histórico. Rio de Janeiro: Edições Lumen Christi 1947.
- [11] Cunha CAM. A arte de curar nos tempos da colônia. Recife: Fundação de cultura da Cidade do Recife 2004.
- [12] Schmalz AC. *Receituário de Joaquim Jerônimo Serpa – Hospital de São Bento de Olinda*. Recife: Arquivo. Público Estadual, Imprensa Oficial 1966.
- [13] Mello EC. A outra independência: o federalismo pernambucano de 1817 a 1821. São Paulo: Ed. 34 2004.
- [14] Pimenta TS. Transformações no exercício das artes de curar no Rio de Janeiro durante a primeira metade do Oitocentos. *História, Ciências, Saúde - Manguinhos* 2004; 11: 67-92.
- [15] Brumitt RK, Powell CE, Eds. *Authors of Plant Names: a list of authors of scientific names of plants, with recommended standard forms of their names, including abbreviations*. London: Royal Botanic Garden Kew 1992.
- [16] Zar JH. *Bioestatistical analysis*. 3rd ed. Rio de Janeiro: Prentice-Hall do Brasil Ltda 1996.
- [17] Ayres M, Ayres Júnior M, Ayres DL, Santos AA. *BIOESTAT - Aplicações estatísticas nas áreas das ciências bio-médicas*. Belém: Ong Mamiraua 2007.
- [18] Sheikh K, Ahmad T, Khan MA. Use, exploitation and prospects for conservation: people and plant biodiversity of Naltar Valley, Northwestern Karakorums, Pakistan. *Biodivers Conserv* 2002; 11: 715-42.
- [19] Guarim-Neto G, Morais RG. Recursos medicinais de espécies do cerrado de Mato Grosso: Um estudo bibliográfico *Acta Botanica Brasílica* 2003; 17: 561-84.
- [20] Gottlieb O, Borin MRMB. Shamanism or science? *Anais da Academia Brasileira de Ciências* 2002; 74: 135-44.
- [21] Moerman DE, Estabrook GR. Native American's choice of species for medicinal use is dependent on plant family: confirmation with meta-significance analysis. *J Ethnopharmacol* 2003; 87: 51-9.
- [22] Al-Hindawi MK, Al-Deen IHS, Nabi MHA, Ismail MA. Anti-inflammatory activity of some Iraqi plants using intact rats. *J Ethnopharmacol* 1989; 26: 163-8.
- [23] Gené RM, Cartaña C, Adzet T, Marín E, Parella T. Cañigueral. anti-inflammatory and analgesic activity of *baccharis trimera*: identification of its active constituents. *Planta Medica* 1996; 62: 232-5.
- [24] Atta AH, Alkofahi A. Anti-nociceptive and anti-inflammatory effects of some Jordanian medicinal plant extracts. *J Ethnopharmacol* 1998; 60: 117-24.
- [25] Imai H, Osawa K, Yasuda H, Hamashima H, Arai T, Sasatsu M. Inhibition by the essential oils of peppermint and spearmint of the growth of pathogenic bacteria. *Microbios* 2001; 106: 31-9.
- [26] Işcan G, Kirimer N, Kürkcüoğlu M, Can Başer K.H., Demirci F. Antimicrobial screening of mentha piperita essential oils. *J Agric Food Chem* 2002; 50: 3943-6.
- [27] Almeida CFCBR, Albuquerque UP. Uso e conservação de plantas e animais medicinais no Estado de Pernambuco (Nordeste do Brasil): um estudo de caso. *Interciencia* 2002; 27: 276-85.
- [28] Martins-da-Silva RCV. Taxonomia das espécies de *Copaifera* L. (Leguminosae - Caesalpinioideae) ocorrentes na Amazônia brasileira. Tese (Doutorado em Ciências Biológicas – Botânica) – Museu Nacional/ Universidade Federal do Rio de Janeiro, Rio de Janeiro 2006.
- [29] Silva MA, Loureiro JC. Naturezas enquadradas: os quintais e cercas de Olinda, Brasil. In: *V Encuentro Internacional Ciudad, imagen y memoria. Patrimonio cultural vs. patrimonio natural: un dialogo necesario*. Santiago de Cuba 2007.
- [30] Loureiro JC. *Pelas entranhas de Olinda – Um estudo sobre a formação dos quintais*. Dissertação de Mestrado Programa de Pós-Graduação em Arquitetura e Urbanismo. Universidade Federal de Alagoas, Brasil 2008.
- [31] Gardner G. *Viagens no Brasil, de 1836-1841*. v. 223. São Paulo: Edição "A Brasileira" 1942.
- [32] Bureau E. *Memoire presente au Government de Sa Majeté L'Emperateur du Brésil sur l'utilité d'introduire en Europe un certain numéro des médicaments brésiliennes, et sur les moyens qu'on pourrait employer pour arriver à ce but*. "Arquivo Nacional do Rio de Janeiro, Códice 807" 1868, vol. 15.

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