

Medicinal use of the main Boldo Species in Brazil and in Lusophone Africa Countries

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Abstract— *The use of medicinal plants as an alternative source of treatment, prevention and cure of various diseases is a practice that comes with ancestry. Currently, the search for well-being and new forms of natural treatment without many chemicals, makes the demand for herbal medicines increase every day. Among these, we have the boldo, which has contributed to cure and alleviate some evil diseases such as: liver, poor digestion, stomach, and hemorrhoids. However, in Brazil, as well as in Portuguese-speaking African Countries - (PALOP) there is still a deficit or shortage in research involving this species. The objective of this work is to present a profile of the main boldo species and different forms of use in Brazil and in the PALOP countries (Angola, Cape Verde, Guinea Bissau, Mozambique*

Keywords — Medicinal use; Bilberry; Brazil; Lusophone Africa; Sustainability.

and São Tomé and Príncipe) from the perspective of health and sustainability. To carry out the work, a narrative review of the literature was carried out with a descriptive character, through the selection, reading, analysis and interpretation of articles published in full in scientific journals, in Portuguese and in English, available on the internet. In the search for articles, the Boolean AND operator was used. To better obtain the results, it was necessary to use the following keywords: medicinal use, boldo, Brazil, sustainability and medicinal use, Lusophone African countries, PALOP and sustainability. The chosen platforms were SciELO, LILACS and Google and Academic. The use of the highest incidence of 01 species of boldo in Portuguese-speaking African countries, known as Boldo-Africano (*Plectranthus barbatus*), was identified. In Brazil, 08 species are cultivated, being used commercially the species *Vernonia amygdalina*, (*Gymnanthemum amygdalinum*), African Bilberry/Garden Bilberry (*Plectranthus barbatus*), Boldo possum (*Plectranthus backpacks*) and Chilean Boldo (*Peumus boldus*, Monimiaceae), the latter being imported. In Brazil, the health strategies of the Family Health Program - PSF contemplate another look at the needs of the communities assisted by the program, while in Lusophone Africa, the health systems have a small and poorly distributed chain of medicines that, for the most part, do not even arrive for a third of the population. The study points to the need to carry out more research on the subject, as the results of these research can be extremely important in the dissemination of the correct way of use and indication, which can contribute to the preservation of species and maintenance of the cultural legacy of biodiversity, knowledge base on the use of medicinal plants and herbal medicines, such as boldo.

I. INTRODUCTION

Medicinal plants are part of the traditional culture of many peoples, based on the need for healing, well-being, and preventive health. This strategy was the basis for the dissemination of the use of plants for medicinal purposes throughout human history. The contribution of traditional medicine and the use of medicinal plants preceded the pharmacological knowledge that is currently used on a commercial scale. It is noteworthy that the use of plants for medicinal and herbal purposes continues to be a routine practice in many traditional communities around the world.

According to Gadelha (2013, p. 2), medicinal plants are part of plant species with the purpose of treating and curing diseases and their use constitutes a practice that dates to the beginning of civilization. Thus, from the moment that man became aware that it was possible to modify the environment for his own benefit, he began to use some plants for medicinal purposes” (GADELHA, 2013, p. 2).

The processes resulting from globalization point to two well-observed aspects: the first related to the knowledge of local communities, how traditional communities cultivate the culture of using these medicinal plants in each country,

and secondly, how medicinal plants are used in other countries from of commercial relationships and social interaction between people from different nations and geographic regions, “the use of medicinal plants from traditional Indian and Chinese medicine, completely unknown to Western peoples , is increasingly frequent ” (VEIGA JUNIOR; PINTO; MACIEL, 2005 , p. 519).

However, the cited authors point out that the use of medicinal plants is increasingly associated with commercial actions and not because of the need for quality of life and well-being of the population, and it is healthy to understand the dynamics that exist between different countries, with different cultures. and the existing relationships after the first contact relationships. In this context, the present work presents two perspectives; initially addresses the relationship of the use of medicinal plants in Brazil and the PALOP, also known as Lusophone Africa, with observance in boldo and then an analysis of the use by traditional communities and their purposes from the perspective of health, sustainability, and biodiversity.

The history of relations between Brazil and Africa is permeated by a history of pain and suffering, but positive aspects related to cultural development, such as traditional

medicine, exchanges of experiences and knowledge, as well as the maintenance and appropriation of culture over the centuries, deserve to be highlighted., from the first social interactions even if forced, conflicting and violent. Both in Brazil and in Africa, history shows that, essentially, the basis of tribal and native cultures contributed to the models of social organization, based on knowledge of the environment, here indigenous peoples and there the ethnolinguistic groups that characterize African countries, united language, customs, institutions, and traditions.

Africa is one of the continents known for its biodiversity and its typical tropical forests that provide environments for a vast cultivation of plant species used by the population for different purposes such as food, medicine, and crafts. The use of these medicinal plants is notorious mainly in communities and families that have few financial resources to purchase conventional medicines, thus having as an alternative the use of medicinal plants that mostly grow in their cultivated backyards or spontaneously. In addition to being easily accessible to communities, it is a more accessible and healthier way to treat some diseases, it is traditional knowledge transmitted from generation to generation, carrying with it the high cultural value of communities or regions. As we can see, this biodiversity adds very rich values about the use of plants for medicinal purposes.

Although the use of plants by traditional communities (indigenous, quilombola and rural) is part of our culture, in Brazil, medicinal plants from native flora are consumed with little or no proof of their pharmacological properties, propagated by users or traders. Many times, these plants are even used for medicinal purposes other than those used by forestry (VEIGA JUNIOR; PINTO; MACIEL, 2005, p. 519).

The use of medicinal plants or traditional medicine is still a well-preserved heritage, although these plants do not contribute much to the regional trade in natural products, this can be attributed to the lack of support funds or promotion of research on regional native plants, thus contributing to the very cultural devaluation of native species.

The lack of material and processing of these plants may contribute to their regional extinction. Abdullahi (2011) cites the use of aloe vera (*Aloe vera*), one of the native plants of Africa and known almost everywhere in the world, but which in the African continent itself is not very widespread, processed and much less researched about it, a similar situation that the boldo that, even though it is not native to Africa, adapted very easily and is well known. Its use is nothing more than the empirical knowledge left or passed on by its ancestors and is increasingly in disuse,

being forgotten and becoming extinct.

The revitalization and conservation of these medicinal species of the boldo type is extremely important, mainly because they are species that are mostly used in the treatment and prevention of various diseases since ancient times. Boldo is known to be a crop that is easy to grow, resistant to water stress, does not require much machinery or chemical fertilization and, when necessary, fertilization with well-cured cattle manure, chicken manure or compost is recommended. organic. When the cultivation is controlled it can be done by seedlings or in seeds, in the ground or even in vases, however in Africa the cultivation is still quite traditional, most of the cultivation is done in the soil in beds with a depth of 15 to 20 cm, with a standard spacing of 0.50 x 1 m between plants and when planted in vases, boxes or recyclable basins, the standard depth is 20 cm, which is measured by the same eye (ABDULLAHI, 2011).

Boldo planting should preferably be carried out in regions with a tropical climate, it does not tolerate soggy soils, preferring regions with acidic soils. Borba et al. (2012) state that the information available from an agronomic point of view is scarce, which is why management techniques are mostly unknown. There is a need to intensify research on agronomic management for these species and create standardized material with information on management. In Africa or in some African countries it is treated as Unconventional Food Plants - PANC, as it is a plant that grows spontaneously in backyards, which is why good general agronomic practices of boldo or medicinal plants in general are not widespread, which would help the farmer to be more efficient and make sustainable use of biodiversity in the field.

Boldo is known for its different uses, such as teas for stomach pain, to cure hemorrhoids, intestines, and liver and when processed, the essential oil is extracted with different uses. Loya et al. (2009) state that the consumption of medicinal plants has bases and traits in the family-based tradition passed from generation to generation and in religion, making it the main alternative for promoting health in communities.

With this, it can be understood that many societies still use medicinal plants, either empirically or scientifically, African countries are no exception, as they are part of the 80% of the world's population that use medicinal plants to meet their needs.

In this sense, the work aims to present a profile of the main species of boldo and different forms of use in Brazil and in African countries with the official Portuguese language (PALOP) from the perspective of health and sustainability, through a narrative review of the literature.

II. METHODOLOGY

To carry out the work, a narrative review of the literature was carried out, with a descriptive character, through the selection, reading, analysis and interpretation of articles published in full in scientific journals, in Portuguese and in English, available on the internet. The research was carried out using the following keywords: medicinal use, boldo, Brazil, Lusophone African countries, PALOP and sustainability. During the search for works on the subject on scientific article search platforms, using the Boolean AND operator, the words “medicinal plants and phytotherapy” were directly combined with each of the other keywords. The platforms and databases used were SciELO, LILACS and Google and Academic.

For the selection of the articles, search criteria were established, through the keywords and elaboration of the development of the work, through a significant literature, which could generate knowledge about the use of medicinal plants of the boldo type, the most used species in the countries of Lusophone Africa and Brazil.

III. RESULTS AND DISCUSSION

The methodology used during the bibliographic survey and the results obtained are registered in the indicated repositories, having been characterized by the similarity of objectives identified in each text, as shown in Table 1.

Table 1 - Table of authors, year and publication of the titles used in the research.

AUTHOR	YEAR	TITLE
ABDULLAHI, A.A.	2011	Trends and challenges of traditional medicine in Africa.
AUGUSTINE, AB	2016	Ethnobotany: traditional and scientific knowledge
CESAR, MGA	2021	Chemical study and evaluation of the cytotoxic and antioxidant activities of leaves and flowers of <i>Plectranthus neochilus</i> Schltr.
CONDE, P. et al.	2014	The Botanical Mission of Mozambique (1942-1948): contributions to the knowledge of the medicinal flora of Mozambique
FERNANDES, JM; LOPES, CRAS; ALMEIDA, AASD	2017	Morphology of medicinal boldo species cultivated in Brazil.
GREGORIO, AS	2021	Ethnobotanical survey of traditional female knowledge of medicinal plant species with emphasis on boldo in urban backyards in the GM3 neighborhood in the municipality of Tabatinga-AM.
MAIA, ICM et al.	2017	Development and characterization of boldo oral solution in the pharmaceutical industry of Pernambuco.
MUCHAIA, AJ; NANVONAMUQUITX, SJA	2021	Ethnobotanical survey of medicinal plants used by the Nacuale community, in Quirimbas National Park, Mozambique.
SILVA, LC N	2014	Dissertation for Obtaining a master's degree in Biomedical Sciences
SOUZA, MBR; MORAES, SJV; ALVIM, HGO	2021	Bilberry and its benefits in gastrointestinal diseases.

Source: own authorship (2022)

The cataloged authors in general point out the relevance of the use of medicinal plants for the treatment of diseases, care for the person, associated with the traditional knowledge of the places, pointing to similar paths between Brazil and the Portuguese-speaking African countries. The use with the highest incidence of a species of boldo in the PALOP, known as Boldo-Africano (*Plectranthus barbatus*).

MEDICINAL USE OF BOLDO IN AFRICAN COUNTRIES

The textual analysis of the researched sources points out that over the years the cultivation of boldo has advanced in some countries, but in Africa the most frequent cultivation or that best adapted was the African boldo or simply *Mbozane*, as it is popularly called in Mozambique, or *capungo-pungo* as it is known in Angola.

The *Plectranthus barbatus* or simply boldo false

originates in India, but became popular in several continental countries, being confused by the name because it originates from Africa; its adaptation and expansion in Africa is since most African countries have tropical/dry climates and the African boldo is characterized by its resistance to dry climates.

Viana (2011) states that African boldo contains a high biological value (AVB), which makes it widely used in traditional medicine. Agostinho (2016) recommends that urgent studies be carried out, especially in regions where medicine is still used. traditional. For Silva (2014), the fact that African countries are poor and of slow development influences the use of traditional medicine, mainly because it is vast and rooted and the healer plays the role of specialist in medicinal plants.

Boldo- African has a bitter taste, characteristic odor and is popularly known as an antidote in colic for newborns, but it is contraindicated for pregnant women. Lukhoba et al. (2006), also mention its uses in the treatment of gastritis, intestinal spasms, liver, and dental diseases; in asthma, bronchitis, pneumonia, and other respiratory diseases. It is widely used in Africa, especially in Mozambique, where it is often used to cure hemorrhoids.

Currently, the use of boldo as a flavoring and essential oils has been conquering important niches in the market and, not only that, but it has also increasingly enriched the scientific shelves. These oils are extracted from plants and the lack of adequate processing and techniques in African countries makes it impossible to carry out research on the processing of oils, thus limiting their use to only the leaves and roots that do not need any processing and it is a knowledge of your domain.

Authors such as Tchamba (2019), in Angola, Silva (2014), in Guinea Bissau and Abdullahi (2011), in his article on the trends and challenges of traditional medicine in Africa, are unanimous in stating that it is extremely urgent that more research and practical studies that demonstrate the importance of preserving and using these plants, such as the African boldo and other medicinal plants with therapeutic actions, to prevent and cure various diseases, mainly because Africa is one of the continents where it is most used traditional medicine . These oils can be defined as complex mixtures of volatile, lipophilic substances, with low molecular weight, generally odoriferous and liquid, consisting, in most cases, of molecules of a terpenic nature and many of these oils have a strong, pleasant, and striking odor or aroma (MORAIS, 2009).

MEDICINAL USE OF BOLDO IN BRAZIL

Brazil's potential for the use of medicinal plants is closely linked to its biological diversity, namely:

It is understood that Brazil, with its broad genetic heritage and cultural diversity, can establish its own and sovereign development model in health and use of medicinal plants and herbal medicines, which excels in the sustainable use of the components of biodiversity and respect the ethical principles and international commitments assumed, notably the CBD, and thus promote the generation of wealth with social inclusion (BRASIL, 2016, p. 19)

The studies by Fernandes, Lopes and Almeida (2021) indicate that in Brazil 08 species of boldo are cultivated, namely *Gymnanthemum amygdalinum*; *Plectranthus amboinicus*; *Plectranthus barbatus*; *Plectranthus grandis*; *Plectranthus neochilus*; *Plectranthus ornament* and *vernonia condense*. The species most used for medicinal purposes are *Gymnanthemum amygdalinum* (Asteraceae), *Plectranthus barbatus* and *Plectranthus neochilus* (Lamiaceae), the three medicinal species of boldo, cultivated in Brazil, are used to treat stomach and liver disorders (FERNANDES; LOPES; ALMEIDA, 2021, p. 12).

Associated with the species cultivated in Brazil, Boldo do Chile (*Peumus boldus*), with endemism in the central regions of Chile. In Brazil, although Boldo-do-Chile is imported, it is one of the best known and most popular plants in the culture from north to south of the country, except for different species that are also commonly called boldo (NASCIMENTO, 2019, p. 16).

For the cited authors, the origin of the species cultivated in Brazil refers to the African and Asian continents. The *Gymnanthemum* species *amygdalinum* is native to Tropical Africa, the species *Plectranthus barbatus* is native to the rocky forests of Ethiopia, Sudan, Tanzania, and India. The species *Plectranthus neochilus*, known colloquially as lobster bush, fly bush or mosquito bush, is native to South Africa, Botswana, Zambia, and Zimbabwe.

Studies indicate that the most used plants in Brazil are the result of the interaction between people of different origins and cultural relations, since in Brazil the use of medicinal plants for the treatment of diseases is rooted in the indigenous, African, and European immigrant cultures (STEFANELLO, 2018, p. 2).

Boldo-do-chile is widely used for the treatment of gastrointestinal and liver diseases, its leaves are rich in oxidants, beneficial in the treatment of gallstones, liver congestion, liver failure and oxidative stress associated with diseases (NASCIMENTO, 2019, p 12).

Converging with this thought, studies reveal that Brazil is the country with the greatest biodiversity on the planet, which, associated with a rich ethnic and cultural diversity, holds valuable traditional knowledge associated with the use of medicinal plants, having the necessary potential for the development of research with results in appropriate technologies and therapies (BRASIL, 2016, p. 14).

As shown, there is a need to carry out research to better understand the possibilities of exploiting the different species of boldo, whether cultivated in Brazil and used commercially or less used. We believe that the results of this research will contribute to the dissemination of correct information regarding the use, function, and medicinal properties of boldo.

IMPACT OF THE POPULAR USE OF BOLDO IN LUSOPHONE AFRICAN COUNTRIES AND IN BRAZIL IN TERMS OF SUSTAINABILITY AND PUBLIC HEALTH

Man's evolution shows that since his ancestry, he has always survived on the basis of products from nature, whether for food, construction or to cure his illnesses; this knowledge has been perpetuated until the present day, because in the whole world there are still several regions that spread the use of plants as medicines, in some of these regions it is the only option to relieve their pain and the use of medicinal plants continues.

Currently, there is concern about the effects that are being generated by allopathic medication such as African boldo, which has led pregnant women to resort to the use of medicinal plants as an alternative in the treatment of some pregnancy symptoms, but many of them are not aware that most of them they can be abortive, as is the case with the African boldo (MORAES et al., 2018).

The use of African boldo as a medicinal plant brings with it some effects that can be very serious for health, especially when ingested in high doses, causing abortions in pregnant women; in the same intensity that conventional medicines cause overdose, medicinal plants of the boldo-African type, when poorly dosed, can cause the same effect. Silva (2014) states that the fact that they are natural medicines does not negate the possibility of being partially harmful. Conde et al. (2014) report that the fact that medicinal plants are used empirically, without many restrictions and that most dosages are measured holistically, can be harmful to public health if they are used irrationally.

Africa is considered one of the poorest continents, with conventional health systems that are still precarious and most of them do not reach everyone, and when they do, they only supply a part of the population, which is why this region still depends heavily on medicinal plants to prevent and cure your pains. Silva (2014) points out that in Africa the use of medicinal plants is rooted and has always been used empirically, based on beliefs and religion, undergoing only field tests, that is, tests were carried out on people, where patients ingested a certain dose and if it worked, the other members of society would start using that dose, which meant that many people, at that time, would even die, because the doses are not linear, this form of use lasts until the present day .

Abdullahi (2011) states that with the evolution and new way of living, young people have been neglecting traditional knowledge and practices, an example of these practitioners is healerism, which has broader knowledge about the use and management of medicinal plants, but the new generations have been eliminating these practices and it is known that this is extremely important knowledge of the intangible cultural heritage. Due to the extreme cultural importance of traditional knowledge, which transcends generations and preserves identities, it is necessary to encourage these practices and cultures among young people. The loss, forgetfulness, and devaluation of the "living tradition" and sustainable practices can cause cultural damage to Africa and humanity (BÂ, 2010).

In Brazil, the health strategies of the Family Health Program - PSF contemplate another look at the needs of the communities assisted by the program. For Pilla, Amorozo and Furlan (2006), in Brazil, although the official health system is free and extends to the interior, it cannot adequately meet the needs of communities and people, mainly due to the lack of purchasing power, such as the lack of professionals who serve the community satisfactorily. In addition, industrialized medicines are expensive, leading people to use medicinal plants that are usually grown in their own backyards.

It is known that there is a need to guide the population regarding the use of medicinal plants that may be responsible for the treatment of many primary diseases, with good economic results and improvement in the health of the low-income population (BRASILEIRO, 2008, p. 1).

To encourage the use of medicinal plants associated with clinical treatments, the National Policy for Medicinal Plants and Herbal Medicines was launched, approved by Decree No. rational use, promotion of production chains, sustainable use and with a focus on the sustainable development of biodiversity for collective health.

IV. FINAL CONSIDERATIONS

In Africa, as well as in Brazil, medicinal plants occupy essential levels, hence the need for preservation and conservation of these species is extremely important, especially for new and future generations. The use of African boldo is little explored, with the main species being the *Plectranthus barbatus* or simply African boldo which is recurrent, as well as the species cultivated in Brazil like *Gymnanthemum amygdalinum*, *Plectranthus barbatus* and *Plectranthus neochilus*, with relevance in popular use and commercialization. In this way, one perceives the need for incentives and investments in cutting-edge technologies, such as the improvement and multiplication of species, as in this way better use is made of the diversity of fertile soils that the region has, both in Portuguese-speaking countries and in the producing regions. in Brazil.

Research based on ethnobotany, such as the investigation of traditional medicine, associated with the study of the phytochemical profile of medicinal plants and/or organic chemistry, associated with pharmacological studies, as well as studies of the active principles and use of herbal medicines, is a path that enables the integration between different areas of knowledge for the study, production, and safe use of products of plant origin. Boldo, as it is a plant used on a large scale, becomes the basis for this proposed action.

It is opportune to mention the recurrent need for further studies of both boldo and other medicinal plants, associated with traditional knowledge, ensuring easy access for communities that hold traditional knowledge about the purposes and uses of medicinal plants.

The results of this study enable us to conclude that research and/or studies on medicinal plants and traditional medicine are relevant and deserve special attention, because in addition to the use of the plant, the traditional knowledge passed on between generations about the local knowledge, the use and usefulness of medicinal plants can contribute to people's health care, in a holistic way, and in terms of sustainability.

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