



RESEARCH ARTICLE

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## POPULAR KNOWLEDGE OF MEDICINAL PLANTS AND AFROINDIGENOUS CULTURE: COSMOVISION OF ELEMENTARY SCHOOL STUDENTS AT A MUNICIPAL SCHOOL IN THE INTERIOR OF CEARÁ, BRAZIL

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### ARTICLE INFO

#### Article History:

Received 03<sup>rd</sup> November, 2019

Received in revised form

11<sup>th</sup> December, 2019

Accepted 26<sup>th</sup> January, 2020

Published online 27<sup>th</sup> February, 2020

#### Key Words:

Medicinal plants. Culture. Indians. Ancestrality. Afro-descendants.

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### ABSTRACT

The present research aims, in a general way, to understand, from the reports of elementary school students, the conceptual understanding of medicinal plants through the study of Ethnobotany; specifically, it seeks a cognitive conceptual diagnosis on the already existing popular knowledge of the research subjects in relation to medicinal plants, highlighting the importance of cultural heritage and indigenous and afrodescendant ancestry. Methodologically the study is based on a qualitative approach with a descriptive-exploratory character. The *focus* of the investigation was the Padre Antônio Crisóstomo do Vale Municipal Elementary School, linked to the public school system of the city of Acarape, Ceará. The strategic techniques for data and information collection were literature review, application of a structured questionnaire, preparation of an illustrative *brochure* on medicinal plants and a conversation wheel between subjects and participating researchers. The results show that herbal practices are still used and that these alternative means of treatment protect their ancestral essentiality, and the popular knowledge about medicinal plants cited in this text specifically is passed down through the generations through oral tradition. It is concluded that the approach to the students participating in this research revealed the recognition of the importance of conducting ethnobotanical studies in order to rescue the traditional knowledge of local communities and the culture of indigenous peoples and afro-descendants, which are lost with the replacement of generations.

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**Citation:** Antônio Roberto Xavier, Matias Neto Alves Ferreira, Francisca Aline da Silva Andrade et al. 2020. "Popular knowledge of medicinal plants and afroindigenous culture: cosmovision of elementary school students at a municipal school in the interior of Ceará, Brazil", *International Journal of Development Research*, 10, (02), 33632-33637.

### INTRODUCTION

The human being, since it started to be said as a "rational being", started to enjoy to the maximum what nature offers: food, housing, clothing, among other goods and services. When the hominid began to have a more developed frontal lobe that gave him the possibility of more ingenious and rapid thoughts, *Homo sapiens* (an example of this evolution) began to do alchemy with the materials coming from the environment.

The interest of ancient civilizations in relation to nature and especially to plants had some reasons; besides serving as food, plants had healing properties and at that time people saw them as the main or only alternative for the cure and treatment of certain diseases. Nowadays plants are still used for this purpose, especially traditional communities and low-income people. However, it is notorious that over the years this knowledge from oral tradition has been lost, giving way to the non-use of natural resources, the incorrect use of plant species and the

devaluation of the knowledge acquired over thousands of years from our ancestors. The use of medicinal plants is a popular knowledge that has been passed from generation to generation over the centuries and its study, according to Amorozo (1996) and Elisabetsky (1999), may have three distinct and essentially important implications, namely: to rescue the traditional cultural heritage, ensuring its survival and perpetuation; to optimize current popular uses, developing therapeutic preparations (home remedies) at low cost; and to organize traditional knowledge so as to use it in processes of technological development. This research is of descriptive-exploratory character, having as technical methods (procedural) the research-action and the qualitative approach. It aligns itself to the inductive method, which is the one that foresees that, by experimental induction, the researcher can reach a general law through the observation of certain particular cases on the observed object (phenomenon/fact). That is, part of a local reality to understand the global (GIL, 2010; MOREIRA, 2011; POPPER, 2013). The main outline of this research explicitly corroborates the writings of the above-mentioned authors, since, through this ethnodial approach research, it is possible to carry out an ethnobotanical study in an elementary school located in the municipality of Acarape, Ceará, which will specifically have the assumptions of diagnosing the pre-knowledge cognitively among the students and highlight to the target audience that the use of medicinal plants is a predominantly African and indigenous heritage. The findings of this investigation are organized in four textual sections, in addition to this introduction. The first is intended for the main conceptual and epistemological definitions based on the theoretical framework, which is subdivided into a theoretical definition of Ethnobotany and conceptual diagnosis of popular knowledge and the use of plants among indigenous cultures and Afro-descendants. The second refers to the explanations on the main methods and techniques used for data collection and generation. The third seeks to understand and explain the results and concomitantly the discussions of the data. The fourth deals with final considerations, in which some conjectures or judgments are expressed about the findings of this research.

**Ethnobotany, medicinal plants and popular knowledge of African and indigenous culture:** Throughout history, man has related to his environment and his resources (such as plants) fundamentally in function of his survival. With the arrival of industrial and technological processes, mankind started to extract a variety of substances from the most diverse parts of plants for the benefit of health, food, energy, etc. Ford (1978) called this direct relationship between humans and plants in dynamic systems Ethnobotany. This study covers the understanding of the inter-relationships of human societies with nature, having an interdisciplinary and integrative character, which is demonstrated in the diversity of cultural, social and environmental factors. As it is perceived, medicinal plants and their techniques are intricately linked to the culture of each society, so Ethnobotany studies the relationship of the use of these plants with man and the way these plants are used in the healing process (ROCHA; BOSCOL; FERNANDES, 2015). According to Alcorn (1995 *apud* ROCHA; BOSCOLO; FERNANDES, 2015), this area of Botany aims at the diligence to commit to the developing world, acquiring a strategic character as its integrative focus. According to Schultes and Reis (1995), it is speculated that the origin of Ethnobotany coincides with the appearance of the human species itself, or rather, with the beginning of the first contacts between this

species and the Plant Kingdom. This is a notion of Ethnobotany that takes it as something proper to a culture or society. In its beginning, Ethnobotany had a more restricted character, studying the interrelations between the plants and the so-called "primitive" societies. As time went by, this limitation was overcome and his research expanded, and now not only indigenous societies, but also industrial societies and their established relationships with flora, are part of his field of study (ALBUQUERQUE; ANDRADE, 2005). In the case of Brazil and other developing countries, the construction and transformation of Ethnobotany takes place in a scenario of cultural diversity (involving the knowledge and practices of its inhabitants) and biological diversity, which constitute a heritage of immense potential value, including plants of interest and market potential that may be possible sources of income generation with environmental sustainability. It is possible to state, according to Araújo *et al.* (2007), that knowledge about medicinal plants has always followed the evolution of man through the ages. These authors state:

Remote primitive civilizations became aware of the existence, alongside edible plants, of other plants with greater or lesser toxicity which, when experienced in the fight against diseases, revealed, although empirically, their healing potential. All this information was initially transmitted orally to later generations and then, with the appearance of writing, it began to be compiled and kept as a precious treasure. (ARAÚJO *et al.*, 2007, p. 45). Therefore, knowledge about the use of medicinal plants can be considered a great legacy left to mankind that has been perpetuated over the centuries, which is corroborated by Tuxill and Nabhan (2001), who say that the research studies concerning Ethnobotany help planners, development companies, governments and communities to architect and implement conservation and sustainability practices. In the writings of Paz *et al.* (2015), it is elucidated that the use of medicinal plants comes from the beginning of civilization, being widely spread by individuals who, most of the time, are called healers, who diagnosed that some plants had compounds that could alleviate or cure some diseases, initiating then the science that is now known as Phytotherapy. As the use of these medicinal plants is usually linked to the culture of the people or of popular knowledge, the same occurs with the Brazilian Phytotherapy. As our nation is mixed, this practice has great influences, such as African, indigenous, European and Asian, with the first two having more pronounced aspects relevant to this aspect. Milk (1954 *apud* ALMEIDA; BARBOSA; SANTANA, 2012) indicates that both Indians and Afro-descendants were the main plant breeders for the purpose of curing pathologies. Today this is a culture that still persists among the descendants of these peoples, which is being spread in such a way that it has become an alternative medicine. Thus, this theoretical review is divided into three subsections, the first dealing with the theoretical concept of Ethnobotany and the two subsequent ones dealing with medicinal plants, with emphasis on indigenous culture and the relationship between Brazilian Phytotherapy and African culture.

However, before continuing the work, it is necessary to understand some terms. The phytotherapeutic science is focused on medicinal plants and their use in the treatment of diseases, being these plants exemplary of the Plant Kingdom that have active principles that exert some therapeutic action (LOPES *et al.*, 2005), which help in the treatment of diseases and can even lead to their cure, being used in the form of teas or infusions. However, like all medicines, herbal medicines

also need some care in their handling and consumption. Herbal treatments are characterized by the use of plants with their different forms of pharmaceuticals and without the handling of isolated active ingredients (SCHENKEL; GOSMAN; PETROVICK, 2000). As France *et al.* (2008) mention, this practice allows people to reconnect with nature through techniques and rites that are passed on intergeneratively.

**The use of medicinal plants and the influence of indigenous culture:** Man has made use of medicinal plants since the beginning of his existence. In the search for plant species suitable mainly for food, healing and treatment of diseases, our ancestors discovered possible therapeutic applications. The primitive civilizations noticed that there were plants that, when experimented in the fight against diseases, revealed their healing potential (LIMA *et al.*, 2007). According to Albuquerque, Andrade e Silva (2005), in Brazil popular medicine and specific knowledge about the use of plants are the result of a series of cultural influences, such as those of European colonizers, indigenous peoples and Africans. Lorenzi and Matos (2008) claim that the first Europeans to arrive in Brazil soon came across a wide variety of medicinal plants in use by the indigenous people who lived here. The knowledge of the local flora with time has merged with those brought from Europe. African slaves gave their contribution by using plants brought from Africa, many of them used in religious rituals, and are also used for their pharmacological properties. In the history of Brazil, the first ethnographic record referring to Brazilian plants was made by Caminha, in 1500. Species such as urucum (*Bixa orellana L.*) and yam (*Manihot spp.*) were cited, clarifying that the former was used by the indigenous people in body painting for rituals and protection and the latter was used for food (MING, 2001). According to Almeida (2011), the first methodical description of plants used for medicinal purposes by the indigenous population in Brazil is attributed to William Pies, a doctor of the expedition led by Maurício de Nassau to the Northeast of Brazil during the Dutch occupation (1630-1654).

At the time, ipecacuanha, jaborandi and tobacco were described. The author also points out that one of the great and important acquisitions for the therapeutics obtained from the ethno-pharmacological researches with indigenous groups were the cures, which are the famous poisons for arrows used by the Indians of South America. Although they are harmless by mouth, a single drop injected into the bloodstream paralyzes the victim without killing her. For many years, the attention of researchers in Ethnopharmacology was focused on the Amazon, in search of psychoactive products of vegetable origin. In this search, several drugs used by the indigenous people became known, mainly in ritualistic moments. Since then, the use of medicinal plants has been increasingly highlighted (ALMEIDA, 2011). Cavaglier (2014) asserts that the use of medicinal plants for therapeutic purposes has been passed down through the generations over the centuries and that, even in the face of medical progress in various parts of the world, in Brazil medicinal plants are usually one of the options for part of the population, especially the low-income population, due to multiple factors, among which the high cost of industrialized drugs and restricted access to a quality health system can be cited. In contrast, the use of this type of therapy has also grown among people with higher purchasing power, in the search for healthier therapeutic options.

## **Brazilian and African phytotherapy: a transcontinental link?**

As already mentioned, Brazilian culture is a mixture of the customs of other peoples, one of which stands out and stands out from the rest is African. And, like any other Brazilian cultural aspect, phytotherapeutic practices are interrelated with the customs of Afro- descendants and much of the methods for the inputs have suffered African influence. By relating the culture of popular medicine practice to Brazilian historical temporality, enslaved Africans and/or their descendants did a double-handed job. The first one began with the slave trade, which took place between the 16th and 18th centuries, when, according to Almeida (2011), many species of plants used by Africans were brought to Brazil, among them many phytotherapeutic species or those with religious importance. As an example, we have: obí (*Cola acuminata*), orobô (*Garcinia cola*), fava de Aridam (*Tetrapleura tetráptera*) and akôkô (*Newbouldia leavis*), according to Almeida (2011). With the process of "adaptation" of the enslaved to a new land, they implanted "[...] the native plants of Brazil in their culture, through their symbolic medical effect. Thus, by incorporating themselves into the new *habitat* and new social conditions, some plants indispensable to health rituals have been replaced" (ALMEIDA, 2011, p. 44; OSHAI, 2017).

As written above, it can be explained that Africans, in their readaptative epiphany, needed means to connect with the land and nature, with which some began to have contacts with indigenous people who transmitted their "[...] knowledge about native plants and the roles they played in their religious and healing rituals. From then on, blacks began to use them also in their religious meetings" (ALMEIDA; BARBOSA; SANTANA, 2012, p. 28), thus confirming the interface of a link between two cultures separated by an ocean, but which had the same respect and adoration for customs and mother nature (OSHAI, 2017). And the second work took place after the signing of the Golden Law, as it resulted in a process called migratory reflux of Afro-descendants, who brought to the African continent specimens of vegetables, such as maize, guinea, pine nuts, sweet potatoes, among other species (ALMEIDA, 2011). In this way, many descendants of Africans played the role of reaffirming their ancestry with African nature, carrying in their luggage a mixture of indigenous and African experience. The herbal remedies are rooted in various cultures around the globe and are often related to religious tradition; not different from this, the African matrix has this characteristic and brought to Brazil great contributions that remain vivid today (BRAGA, 2015). It is clear that, for Africans, many of the medicinal plants, besides their curative and therapeutic aspect, also stand out in religious rites, as in *candomblé*.

From this perspective, Viegas and Martins (2015) point out that cultural beliefs, in the spiritual bias, have been standing out in today's modern society. Ratifying this position, Anselmo *et al.* (2012) point out that popular medicine in these spaces is gaining more prominence as a result of the multiplicity of information and clarification of science. *Candomblé* is a religion that came from African ancestry by the Sudanese or Yoruba people who worshipped the *orixás* (LIMA, 2007). In turn, the enslaved who came to Brazil brought with them their existentiality and religion, keeping alive their customs until today, one of these is the exercise of popular medicine, in which they use plants, according to Braga (2015), as the main means for obtaining healing. The author also contributes by

elucidating that in this practice the subject man is visualized "[...] in all his dimensions in which he treats the body and especially the spirit, thus escaping the biomedical paradigm so practiced today" (BRAGA, 2015, p. 14; OSHAI, 2017). The use of medicinal herbs for the healing process and also to obtain the balance of body, mind and spirit is something present in the afrodescendant religiosity, as in candomblé (already mentioned) and umbanda. Braga (2015) mentions that, in order to obtain equity, herbal baths made by babalorixás (priests) are necessary. Mota and Leite (2011) support that these semicupials are associated with medicinal plant infusion teas. This duality aims at the welfare of the disciples or worshippers of the above religions. Braga *et al.* (2017) point out that these baths and teas from herbal products have positive aspects when related to therapies for psychic problems such as depression or also the so-called spiritual reconciliations, something diagnosed in candomblé houses investigated by the author, who states: "The dynamics of care of the terreiro to its members can be conceived a group psychotherapeutic action, which involves counseling, musicality, rhythm and belief, in a process of transpsychiatry using plants for the well-being of the people" (BRAGA, 2015, p. 66). This effectiveness of group therapy is confirmed by Lima (2007), who emphasizes that living in these places of plural and mutual coexistence provides the predispositions that allow subjects, when exchanging their experiences, to discover solutions or forces to overcome their afflictions.

Afrodescendant beliefs have a strong connection with natural healing practices. Segunda Almeida (2011, p. 46):

Physiological issues are rarely dissociated from spiritual healing and the conception of life and death. Plants are always present through the use of leaves, roots, fruits and trees of various symbolic representations, [...] used for healing and disease prevention.

Admitting what the author says, one can elucidate that, when a person with a pathogeny ingests tea from a certain medicinal plant, he or she must draw the drink in such a way that he or she not only relies on the chemical and/or pharmacological medicinal properties of the herbal medicine, but also on its magical or spiritual power. Almeida (2011, p. 47) further clarifies that African thoughts bring belief in the ancestor and other spirits and gods directly involved in the healing process, and not only in the chemical components of the plant, for these "[...] are riches which the gods have provided for man. The result of popular medicine comes from people's belief in religion or the simple fact that they understand the healing potential that certain plants have. But something that has been highlighted is that popular medicine only exists to this day because of the faith existing between generations by their ancestors. This is necessary to emphasize the support of the African heritage and its descendants in various branches of culturality, since it is also the form of resistance of a mixed layer of the Brazilian population (ALMEIDA, 2011; OSHAI, 2017).

#### Data collection, analysis and generation

The locus of the investigation (already mentioned in the introduction) was the Escola Municipal de Ensino Fundamental Padre Antônio Crisóstomo does Vale, located in the urban center of the city of Acarape, Ceará, Brazil, and the methods, techniques and instruments for the collection and generation of data and information were varied, as described

below. A structured questionnaire with open and closed questions was applied to an 8th grade class, with 32 students attending. The questions concerned, among other things, how to obtain medicinal plants, the main species used and the origin of this popular knowledge. At the post-term of the application of the questionnaire, a round of talks was opened to discuss some questions that students might have about the use of medicinal plants and their practices, relating the debate to concepts that referred to Afrodescendant and indigenous cultures, seeking to rescue the ancestry of students. And, finally, a minifolder (Figure 1) was given to each student, which had some basic concepts about herbal medicine and ethnobotany, some information about what medicinal plants would be and care for their use, examples about the relationship of these herbal medicines with cultural practices and some specimens of medicinal plants found in the region, which had influence, in some way, from other cultures.



Source: Authors' collection (2020).

Figure 1. Folder on medicinal plants presented to students

In the questionnaire and in the debate, it was sought, based on the theoretical reference, to find out whether the interviewees made use of medicinal plants, where they got the species and if they knew that popular medicine in Brazil is a cultural heritage left by the Indians, Africans and their descendants. It should be noted that research in this direction is necessary for regions rich in biodiversity, such as the region of the Baturité Massif, which has a great exuberance of plant species, about which little is known. This region is represented by various peoples, such as indigenous people, quilombolas and various traditional communities who are adept at alternative medicine and do not have their knowledge based on the scientific literature, so they are not sure of the bioactive potentials present in the plants used. Then it becomes necessary to share the knowledge coming from science with these people so that they can also enjoy this good.

## RESULTS AND DISCUSSION

The application of the questionnaire was done in an 8th grade class with a total number of 32 students enrolled, of which only 27 (84.4%) felt comfortable to participate in the survey, among which 66.3% were female and 33.7% male. This investigative spectrum provides an eventual consolidation of the data that will be presented below, since some authors, such as Anselmo *et al.* (2012), Lopes (2005) and Paz *et al.* (2015), demonstrate that the cultural practices of the use of medicinal plants are more present among groups of women (healers, prayers or benzedadeiras), who highlight the importance

of their ancestors through rites and customs, being those that most influence the transmission of these practices to future generations. The data collected revealed that 77.8% had already used medicinal plants among those interviewed, compared to 22.2% who had not used them, demonstrating that the use of these phytotherapeutic practices is still in evidence in cities in the countryside, even if the subjects are accustomed to an urbanized life, pointing out that most of those investigated (85.1%) were between 13 and 14 years old at the time of the study. It is worth noting that 96.3% of the subjects reported that they had learned to use herbal remedies with relatives or close persons, demonstrating the importance of cultural ancestry and the influence that the transcendence of customs impose on the most current generations. Among the plants used, 77.8% of those investigated elucidated that they were obtained from their own cultivation or from relatives. Among them, 92.6% reported using the teas or inputs of these plants because they are of natural origin and have low cost. As for the issues that instigated the relationship of knowledge about indigenous and African influence in popular medicine in Brazil, 66.7% claimed not to know about this information, while only 33.3% claimed to be aware that the use of medicinal plants is directly related to the culture of indigenous peoples and Africans. When asked about which species of these plants they used to use, the most cited by the subjects of the survey were: fennel grass (*Pimpinella anisum*, Figure 2 - A), being an herbalist of the Asian culture; citron grass (*Melissa officinalis*, Figure 2 - B); and boldo (*Peumus boldus*, Figure 2 - C), with the use originated in Southern Europe.



Source: REFLORA (2020).

**Figure 2. *Pimpinella anisum* (A); *Melissa officinalis* (B) and *Peumus boldus* Molina (C)**

The use of babosa (*Aloe vera*), which is of African origin, was also mentioned, which, in addition to practices aimed at aesthetics, can be used in the treatment of burns and inflammations. In addition to the species already mentioned, the interviewees pointed out the use of the mastic tree (*Schinus terebinthifolius*), a species directly related to the culture of indigenous peoples and Africans commonly used by natives to treat inflammation and as an analgesic, being used, for example, as a means to relieve toothache. It should be noted that, already in the colonial period, the Jesuits, after observations of its use by the indigenous, diagnosed in this plant strong anti-inflammatory and astringent components. Another example used by the Indians in the questionnaire was the mastruz (*Chenopodium ambrosioides*), pointing out that the northeastern natives use this plant as an antiparasitic (CUNHA LIMA *et al.*, 2012). When the subjects were instigated on what would be the best action so that this important cultural memory would not be lost, they elucidated the need to highlight and preserve the customs of our parents and grandparents, because these customs are safeguarded through orality, since, if culture is not passed on and ensured between the generations, many of these practices will be lost

through the ages, and this will result in a great loss to the historical and cultural heritage of Brazil, a loss that is sometimes irreparable.

### Final Considerations

According to the data obtained in this study, it was found that the use of medicinal plants is a widely spread popular and cultural knowledge and that, despite the great advances in medicine in Brazil and the world, the use of plants for medicinal purposes has remained firm. It was found that, in the class where the research was carried out, most of the participating students had already used medicinal plants, demonstrating that the plant species cited in this study reaffirm the importance of conducting ethnobotanical studies in order to rescue the traditional knowledge of local communities and the culture of indigenous peoples and afro-descendants, which is lost with the replacement of generations. Considering the results, it can be concluded that the use of medicinal plants for the treatment and cure of diseases is directly linked to the fact that they are easily accessible, because they are natural resources, because they are low cost and above all because their use is a knowledge that has been perpetuated over the centuries. It is believed that this study brings important and necessary contributions by identifying the percentage of people adept at popular medicine and it is hoped that this research can open doors to new researchers and that it will provide an opportunity to undertake new investigations in this field.

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