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The Importance of the Rescue and Preservation of Medicinal Plants in the North region in the last twenty years

A Importância do Resgate e da Preservação de Plantas Medicinais na Região Norte nos últimos vinte anos

Renato Abreu Lima[I], Reinato Andrade Tembo Xavier[II], Felipe Sant' Anna Cavalcante[III]

ABSTRACT

The objective of this research was to survey published works on medicinal plants in the North Region, analyzing their use and preparation. Given its importance for human beings as well as for other living beings, the preservation of this precious asset on our planet Earth is very pertinent. The method for this study was quantitative, based on works published in the period from 1999 to 2019 with an emphasis on medicinal plants used in the treatment and cure of diseases. Visits to the communities, in the work under study, were analyzed for consultations in the region in order to improve capacities and data on medicinal plants. We found that the most used vegetable species were Lamiaceae, Asteraceae, Fabaceae, Rutaceae, Poaceae, Acanthaceae, Allismataceae, Amarantaceae, Anacardiaceae, Annonaceae, Meliaceae, Musaceae, Myrtaceae, Lauraceae, Malvaceae, Bromeliaceae, Cactaceae, Araceae, Apiaceae, Apocynaceae, Aristolochiaceae and others. Other records were people planting medicinal plants, collecting plant seeds, are used to make infusions to treat toothache, cough, flu, diarrhea and skin diseases.

Keywords: Conservation; Sustainable development; Medicinal plants; Amazon

RESUMO

O objetivo desta pesquisa foi fazer o levantamento de trabalhos publicados sobre as plantas medicinais na Região Norte, analisando o seu uso e preparação. Dada sua importância para os seres humanos como também para outros seres vivos, é deveras pertinente à preservação deste bem precioso no nosso planeta Terra. O método para este estudo foi quantitativo, baseado em trabalhos publicados no período de 1999 a 2019 com ênfase nas plantas medicinais utilizadas no tratamento e cura das doenças. Foram analisadas as visitas às comunidades, apresentadas nos trabalhos em estudo, para consultas na região de modo a apurar os dados melhores e mais confiáveis sobre as plantas medicinais. Constatou-se que as espécies vegetais usadas com maior frequência foram as das famílias Lamiaceae, Asteraceae, Fabaceae, Rutaceae, Poaceae, Acanthaceae, Allismataceae, Amarantaceae, Anacardiaceae, Annonaceae, Meliaceae, Musaceae, Myrtaceae, Lauraceae, Malvaceae, Bromeliaceae, Cactaceae, Araceae, Apiaceae, Apocynaceae, Aristolochiaceae e outras. Outro fato observado foi que os moradores criam hortas de plantas medicinais, recolhem sementes de plantas, usam folhas fazendo infusão principalmente para tratar tosse, gripe, diarreias e pele.

Palavras-chaves: Conservação; Desenvolvimento sustentável; Plantas medicinais; Amazonas

[I] Departamento de Ciências: Biologia e Química, Instituto de Educação, Agricultura e Ambiente, Universidade Federal do Amazonas (IEAA/UFAM), Humaitá, Amazonas, Brasil - renatoal@ufam.edu.br

[II] Programa de Pós-Graduação em Ciências Ambientais, Instituto de Educação, Agricultura e Ambiente, Universidade Federal do Amazonas (PPGCA/IEAA/UFAM), Humaitá, Amazonas, Brasil - reinatoxavier2@gmail.com

[III] Programa de Pós-Graduação em Ciências Ambientais, Instituto de Educação, Agricultura e Ambiente, Universidade Federal do Amazonas (PPGCA/IEAA/UFAM), Humaitá, Amazonas, Brasil - felipesantana.cavalcante@gmail.com

1 INTRODUCTION

Reflection on human practices in society is necessary to make a contribution and thus avoid the permanent destruction of the environment and its ecosystem, however, necessarily involves an articulation with the production of meanings about environmental education. Plants have played a significant role in conserving the health of living species, including humans, who use them for social, moral well-being, relieving themselves from diseases, used as animal feed, gas supplies (the precious oxygen) (MACIEL et al. 2001; SOARES et al. 2015). The plants mitigate the incident light rays that have been plaguing the vast regions of our continent and in particular our country, prevent erosion caused by the rage of rainwater, that is to say has an economic, social and ecological importance.

The registration of traditional knowledge is indispensable, since information about the empirical use of plants is under threat of disappearance. In addition to this fact, the risk of disappearance is another factor that can occur for the decrease of some plant species in order to be used in the treatment and cure of diseases (DUTRA, 2009). Indeed, the various species of medicinal plants in the region are at risk of disappearing from the unsustainable use practiced by the popular for various purposes, be they economic, social, medicinal, commercial, industrial, transportation and many others.

Given that the region has not yet been devastated by anthropological action, it is pertinent that according to researchers: it is possible to plan the occupation and use of its soil, seeking to reconcile the use of natural resources and the conservation of biodiversity, thus ensuring the continuity of the forest with all its richness (VICENTINI, 2001). Before programming any action, man must implicitly plan his activity to predict the possible consequences that may arise from it contemplating the intervening elements such as forest, soil and animals that cohabit in the ecosystem.

Brazil is a country that houses people from various continents and each with its own tradition of dealing with the environment, contrasting the traditions of the country's indigenous people. In recent years, the major concern of peoples is to

undertake migrations by becoming interested in the Amazon Region with numerous biodiversity where many products of sociodiversity and human interest are found (SANTOS et al. 2018).

Currently, there is a concern by the rulers of the country for the rescue of the typical cultural tradition of the people of Brazil with the introduction of Ethnobotanical studies to maintain and contribute to the improvement of medicinal plants in a sustainable way that contribute to the treatment of various diseases, thus maintaining the human health (CARNEIRO et al. 2010).

In this context, Ethnobotany is the discipline that can help to find answers to the various problems of forest use and use based on the assumption that the community has information about plants and their medicinal use, since each community has its own habits and customs in the treatment and use of plants (VEIGA; SCUDELLER, 2015; SALES et al. 2015).

In recent years, we have seen great growth in teaching and research in ethnobiology and ethnoecology in all regions of Brazil. The number of publications launched is a reflection of this movement and, due to a feedback effect, ends up driving new research projects with this focus. In the Northern Region, it has been no different. However, the region has a relatively larger dimension and less concentration of specialists. These factors end up creating a scenario of scarcity of research projects in an environment with high biological and cultural diversity such as the Amazon (HAVERROTH, 2018).

From this study, it can be seen that medicinal plants are the guarantor of life in the northern region of Brazil because the population uses them to treat diseases. Thus, the main objective of the research was to survey a variety of known medicinal plants most commonly used to treat diseases in the northern region of Brazil by reading various scientific articles published in official journals in the country.

2 MATERIAL AND METHODS

In order to achieve the objectives and obtain the expected results, the bibliographic survey of scientific articles dedicated to the study of medicinal plants in the Northern Region of Brazil, were analyzed based on the indexing of the researches carried out in the Scolar Scholar Database, Scielo, PubMed, Science Direct, Google Scholar, Capes and Plataforma Sucupira, most relevant documents in the treatment of ethnobotany and medicinal plants, especially by authors who analyze the issue of recovery of deforested areas. The following combinations of keywords were used: medicinal plants, ethnobotanical and northern region. For that, a reading was done in the titles and abstracts in order to verify if they fit the inclusion criteria.

This method consisted in the selection and consultation of several articles published between 1999 and 2019. Thus, articles published in the last 20 years were analyzed. Included in the analysis were articles on Ethnobotany and medicinal plants, the form of preparation and their application for the treatment and relief of diseases or symptoms. The analyzes were carried out in a quantitative way, since there were many plants cited by respondents of both sexes that treat various diseases, and plants that treat headaches were excluded because they are common to all diseases.

3 RESULTS AND DISCUSSION

We verified 78 scientific works published in scientific journals (articles, dissertations, theses, monographs) of these 37 articles were analyzed as shown in table 1. The authors make an in-depth study of Ethnobotany and natural and exotic medicinal plants, recognizing the need for ecological systems to be the supports for the sustainability of life on planet Earth and to be threatened by the inappropriate or excessive use of human practice in the interaction between human beings versus nature.

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region has a relatively larger dimension and less concentration of specialists. These factors end up creating a scenario of scarcity of research projects in an environment with high biological and cultural diversity such as the Amazon (HAVERROTH, 2018).

According to the readings of the articles, they confer that Ethnobotany is a very old science, only it was not known as science and the populations practiced without the current designation, that is, it was a practice of empirical knowledge taught by adults to new new generations (ALBUQUERQUE, 2006).

Table 1 - Research and publications on ethnobotany in medicinal plants in the North region

Authors	Year of Publication	Title	Periodical	Subject	Place of Collection	Conclusions / Final Considerations
Luz, Francisco Joaci de Freitas	2001	Medicinal plants of popular use in Boa Vista, Roraima, Brazil	Brazilian Horticulture	Medicinal	RR	This combination of different species in the spectrum of medicinal plants of popular use in Boa Vista follows the diversity of habits and culture of people with different origins, with implications on the richness and potential use of popular knowledge in the cure of health problems.
Pinto, Angélica Auxiliadora da Costa; Maduro, Cice Batalha	2003	Products and sub-products the popular medicine commercialized in Boa Vista city, Roraima	Amazon Act	Medicinal	RR	Medicinal products of popular origin can become an alternative to sustainable development in the State of Roraima, if conducted in a responsible manner and mainly benefiting the traditional populations that hold most of the knowledge acquired.
Alárcon, Juan Gabriel Soler	2005	Floristic and ethnobotanical survey in one hectare of terra firme forest in the Middle Rio Negro region, Roraima, Brazil	Economic Botany	Medicinal	RR	The species with the highest use value was *Bertholletia excelsa*. Arecaceae, Lecythidaceae, and Sapotaceae showed a wide variety of uses. The uses were grouped

						into eight categories; those with the highest use values were firewood, technology, and construction.
Santos, Maria Aparecida Corrêa dos; Ferreira, Márlia Coelho	2005	Inventory of medicinal plant species employed by IEPA, Macapá-AP	Amazon: Science and Development	Medicinal	AP	The results of this research are important, as they indicate that, for the production of more significant information about inventory, it is necessary to expand the inventory areas, making a greater coverage of the State, and to determine, more precisely, the demand for vegetable raw material.
Santos, Maurício Reginaldo Alves dos; Lima, Maria Railda	2006	Ethnobotanical Aspects of Popular Medicine in the Municipality of Buritis, Rondônia	Fitos Magazine	Medicinal	RO	The rescue of popular knowledge carried out in this study shows that, despite the richness of Amazonian biodiversity, popular medicine is predominantly based on exotic plants, from other regions of Brazil or even from other countries. Thus, it is also evident the importance of studying medicinal flora, mainly Amazonian, in an integrated, multidisciplinary way.
Pereira, Luciano Araújo; Lima e Silva, Raullyan Borja; Guimarães, Elsie Franklin; Almeida, Mara Zélia; Monteiro, Eugenia Del Carmen Quilodrán;	2007	Medicinal plants of a quilombola community in the Eastern Amazon: Utilitarian aspects of Piperaceae and Solanaceae species	Brazilian Journal of Agroecology	Medicinal	AM	In general, the studied community showed a deep knowledge regarding the use and cultivation of the studied ethnospecies. Studies such as these are of paramount importance for the conservation and sustainable (medicinal) use of plant resources.

Sobrinho, Felipe de Araújo Pinto.						
Santos, Maurício Reginaldo Alves dos; Lima, Maria Railda de; Ferreira, Maria das Graças Rodrigues	2008	Use of medicinal plants by the population of Ariquemes in Rondônia	Brazilian Horticulture	Medicinal	RO	The study of the ethnobotanical knowledge of communities predominantly focused on the primary sector generally leads us to two aspects: the first is the observation of the strategies that humans use to deal with nature, trying to improve their quality of life in some way and; The second is the poignant need to protect ancestral knowledge by retrieving and recording information so as to perpetuate it for future generations. This research will provide support for the phytochemical and pharmacological studies needed to confirm the therapeutic properties of most species studied and to verify their toxicity or harmlessness to human health.
Santos, Maurício Reginaldo Alves dos; Lima, Maria Railda de;	2008	Vegetal resources survey used as phytotherapics in Cujubim city, Rondônia, Brasil	Scientific knowledge	Medicinal	RO	The work highlighted the need to preserve popular knowledge, as well as its wealth and dispersion. Only by systematizing this knowledge will we be able to take advantage of its full potential, either as a basis for scientific research or in the basic procedures of attention to human health.
Nascimento, André	2009	Palm Wealth and	Forest	Ethnobiology	TO	Strategies involving the management and

Rosalvo Terra		Ethnobotany in the Territory Krahô Indigenous People, Tocantins, Brazil				conservation of natural populations should be based on in situ conservation programs, which urgently require species surveys.
Carneiro, Diogo Borges; Barboza, Myrian Sá Leitão; Menezes, Moirah Paula	2010	Useful native plants in the Extractive Reserve Fisherman's Village Caeté-Taperaçu Navy, Pará, Brazil	Botanical Act Brasilia	Medicinal	PA	The residents of the village of Pescadores preferably use the plant resources located on the outskirts of the village. Twenty native species of mangrove and restinga are used, which are basically used for medical, food and technology purposes. Restinga species are used primarily in the food and medicinal categories.
Lima, Renato Abreu; Magalhães, Sandra Aparecida; Santos, Maurício Reginaldo Alves	2011	Ethnobotanical Survey of Medicinal Plants Used in the City of Vilhena, Rondônia	Research & Creation Magazine	Medicinal	RO	Several researches on the use of plants in therapeutic treatments have been carried out.
Siviero, Amauri; Delunardo, Thiago Andrés; Haverroth, Moacir; Oliveira, Luis Cláudio de; Mendonça, Ângela Maria Silva	2011	Cultivation of food species in urban gardens in Rio Branco, Acre, Brazil	Brazilian Botanical Acta	Medicinal	AC	The quantity of species correlated positively in the home gardens. Food plants cultivated in Rio Branco gardens conserve agrobiodiversity and aid in the health and well-being of the residents by improving the landscape, ambience and leisure space of the city.
Martins, Williane Maria de Oliveira; Martins, Lilliane Maria de Oliveira; Paiva,	2012	Agrobiodiversity in backyards and riverside gardens in the Boca do Môa-Acre community	Biothemes	Biodiversity	AC	The rural cutover lands present many species at the same area, and manioc is the main product cultivated. The backyards have spatial arrangements of food species, with emphasis

Fabiano Silveira; Martins, Wilton José de Oliveira; Lima-Júnior, Sebastião Ferreira						on fruits and vegetables, besides medicinal plants. Thus, both the backyards and rural cutover lands participate in the subsistence and income of riparian families from this community.
Siviero, Amauri; Delunardo, Thiago Andrés; Haverroth, Moacir; Oliveira, Luis Claúdio; Mendonça, Angela Maria Silva.	2012	Medicinal plants in urban backyards in Rio Branco, Acre	Brazilian Journal of Medicinal Plants	Medicinal	AC	The cultivation of medicinal plants in urban backyards in Rio Branco helps to combat diseases and promotes ex situ conservation of agroforestry agrobiodiversity, well-being for residents by improving the landscape, microclimate ambience and leisure space.
Martins, Williane Maria de Oliveira; Paiva, Fabiano Silveira; Bantel, Carlos Adolfo	2013	Traditional knowledge of plants in the medical use of the valley microregion Juruá, Acre, Brazil	Brazilian Encyclopedia	Medicinal	AC	It is concluded that the use of plant species used by the root workers in the city of Cruzeiro do Sul is diversified. Phytotherapy in the researched region is conserved, maintaining the identity with the local ethno-knowledge.
Tomchinsky, Bernardo; Ming, Lin Chau; Kinuppi, Valdely Ferreira; Hidalgo, Ari de Freitas, Chaves, Francisco Célio Maia	2013	Ethnobotanical study of antimalarial plants in the middle region of the Negro River, Amazonas, Brazil	Amazon Act	Biodiversity	AM	The knowledge of the use of antimalarial plants is well developed in communities of the Barcelos municipality at the middle Negro River, where the incidence of malaria is still high. We report 55 plants used to treat malaria infection, among them 16 species that had not been previously mentioned in other publications as antimalarial.

Almeida, Larissa Santos de; Gama, João Ricardo Vasconcellos; Oliveira, Francisco de Assis; Ferreira, Maria do Socorro Gonçalves; Menezes, Antônio José Elias Amorim de; Gonçalves, Danielly Caroline Miléo	2013	Use of Flora Species in the Santo Antônio Rural Community, BR-163, Brazilian Amazon, Forest and Environment	Forest and Environment	Ethnobotany	AM	Information gained from ethnobotany tools can: contribute to participatory planning for future community-level activities; promote the creation of participatory conservation programs; and subsidize the choice of species to be protected or have their production potentialized for income generation.
Santos, Maurício Reginaldo Alves dos; Lima, Maria Railda; Oliveira, Carla Liegi Lonardoni Gomes de	2014	Medicinal plants used in Rondônia, Western Amazon, Brazil	Brazilian Journal of Medicinal Plants	Medicinal	RO	The relatively small number of native Amazon species identified can be the result of the loss of knowledge about medicinal plants in the Amazon because of internal migration, extinction of local indigenous groups, increasing urbanization and consequent globalization of the lifestyles
Vásquez, Silvia Patrícia Flores; Mendonça, Maria Silvia de; Noda, Sandra do Nascimento	2014	Ethnobotany of medicinal plants in riverside communities of Manacapuru Municipality, Amazonas, Brazil	Amazon Act	Biodiversity	AM	The research showed that the residents of the communities still have knowledge and make use of medicinal plants as one of the ways to treat their most frequent diseases, such as stomach pain, cough, flu, fever, headache, using mainly the leaves in the drug preparations.

Cajaiba, Reinaldo Lucas; Silva, Wully Barreto da; Sousa, Diogo Nascimento de; Sousa, Alex Soares de	2015	Ethnobotanical survey of medicinal plants commercialized in the municipality of Uruará, Pará, Brazil	Biothemes	Medicinal	PA	Finally, this work generated knowledge about the collection of medicinal plants used in the municipality.
Carmo, Taiane Novaes do; Lucas, Flávia Cristina Araújo; Lobato, Gerciane de Jesus Miranda; Gurgel, Ely Simone Cajueiro	2015	Medicinal and ritualistic plants sold at the 25 de Setembro fair, Belém, Pará	Brazilian Encyclopedia	Medicinal	PA	The socio-cultural and vegetal diversity that exists in fairs in the Amazon region allows us to understand the plots of knowledge, built through the trade and ethno-knowledge of marketers and consumers about the therapeutic herbs that cure and purify.
Lima, Renato Abreu; Pires, Laiza Sabrina dos Santos; Vieira, Natan Gonçalves	2015	Environmental education and the use of medicinal plants used by the population of union district Bandeirante-Rondônia	Electronic Journal on Management, Education and Environmental Technology	Medicinal	RO	The study demonstrated that medicinal plants are of great importance and often the only alternative for the population, as it is part of the daily life of the community. In this way, research and work in environmental education that involve knowledge related to medicinal plants have the possibility of promoting significant reconnections and triggering more effective socio-environmental transformations, establishing a rational relationship between the use of plants and curing diseases.
Veiga, Josephina Barata; Scudeller, Veridiana	2015	Ethnobotany and folk medicine in the treatment of malaria and	Brazilian Journal of Medicinal Plants	Medicinal	AM	Given these results, it is clear that the residents of the community of Julião have satisfactory

Vizoni.		associated diseases in the Julião - lower Rio Negro river community (Central Amazon)				knowledge about medicinal plants, especially those used to treat malaria and its diseases. However, due to their proximity to the state capital and the possibility of faster and more effective treatment for malaria, they only use these plants to treat the consequences of the disease.
Coelho, Diana Lopes; Brandão, Eliel Guimarães; Rosas, Lisandra Vieira; Pinto, Márcia Nascimento; Pantoja, Tatyanna Mariucha Araújo; Lima, Renato Abreu	2016	The medical plant use in fighting parasitosis and intestinal worms good neighborhood in the garden in the municipality Benjamin Constant-AM, Brazil	South American Journal of Basic Education, Technical and Technological	Medicinal	AM	The use of medicinal plants is part of the popular culture of the neighborhood, which are used for the benefit of health, both to assist in relief and for the healing of disease or infirmity, among which are inserted into the parasites and worms intestinal that were the focus of this research. Surveys of ethnobotanical knowledge promote the rescue of knowledge that is often unknown to much of the population, which is involved with the technological world of today.
Santos-Silva, Jéssica Paloma Gama dos; Oliveira, Patrícia Chaves de	2016	Ethnobotany of medicinal plants in the community of Várzea Igarapé do Costa, Santarém-Pará, Brazil	Environment and Sustainability	Medicinal	PA	Riverside communities are a rich repository of knowledge, the relationship between man and the river, the fauna and flora of the ecosystem reveals the importance of conducting ethnobotanical research with this type of community, with a view to bringing returns for themselves and for the community

						world population.
Barreto, Ingrid Ferreira; Freitas, Alessandra Doce Dias	2017	Ethnobotany in agroforestry yards in the Barreiras community in Almeirim-PA	Amazon Business and Administration Magazine	Medicinal	PA	The properties of the Barreiras Community have a great diversity of plants, this floristic richness is the result of the presence of species typical of the region and others that, although they were brought from other places, have been cultivated for a long time. In addition to diversity, plants have multiple uses, since they contribute to the health, food and well-being of the community. The most representative ethnobotanical category was that of food plants and the most used parts were fruits, and this is due to the fact that the plants are grown mainly to complement food in the family unit.
Lima, Rodrigo Gonçalves de; Silva, Renato Barboz da; Lima, Helledsen Ramos da Silva de Lima	2017	Ethnobotanical survey in the surroundings of Adolpho Ducke Botanical Garden, Manaus, Amazonas	Scientia Amazonia	Medicinal	AM	The dwellers in the surroundings of the JBAD have diversified knowledge and use plants (62 species), their main uses are food and medicinal, fruit species are more abundant than medicinal. There is no dependence on fruit production or medicine for survival.
Pereira, Maria das Graças da Silva; Coelho-Ferreira, Márlia	2017	Use and diversity of medicinal plants in a quilombola community in the Eastern Amazon, Abaetetuba, Pará	Amazon Biota	Medicinal	PA	It is expected that the registration and documentation of ethnobotanical knowledge related to traditional medicine in Tauerá-Açú, will be understood by this quilombola community, as a

						contribution to the preservation of collective memory and the valorization of traditional medicine within the community.
Leandro, Yuri Arlindo da Silva; Jardim, Iselino Nogueira; Gavilanes, Manuel Losada	2017	Use of Medicinal Plants in the Health Care of Settlement Residents in Anapu Municipality, Pará, Brazil	Biodiversity	Medicinal	PA	PDS-JV community respondents reported the use of 46 ethnospecies for medicinal purposes. Native and tree species were the most cited for the preparation of medicines, which may be evidence of the influence of the approximation of residences with the forest.
Tomchinsky, Bernardo; Ming, Lin Chau; Kinupp, Valdely Ferreira; Hidalgo, Ari de Freitas; Chaves, Francisco Célio Maia	2017	Ethnobotanical study of antimalarial plants in the middle region of the Negro River, Amazonas, Brazil	Amazonica Act	Medicinal	AM	The middle Rio Negro region is an interesting place to seek novel antimalarial compounds because of the traditional knowledge of the Amazon population in conjunction with the high biodiversity of the region. Many factors could be involved with the use of antimalarial plants by the Barcelos population, such as the accessibility of these medicinal plants, efficiency and safety of using these plants, the accessibility to drugs or other medical treatments, plant bitterness, and the gender of the interviewees. Our results indicate that the population of Barcelos possesses an extensive knowledge on the use of a diverse array of antimalarial plants, and may contribute to the

						development of novel antimalarial compounds.
Santos, Jéssica Juliane Furtado; Coelho-Ferreira, Márlia; Lima, Pedro Glecio Costa	2018	Ethnobotany of medicinal plants in public markets in the Metropolitan Region of Belém do Pará, Brazil	Amazon Biota	Medicinal	PA	Among the resources that were sold, leaves and bark predominate, and trees and herbs were the most expressive life forms. The public markets of the Belém Metropolitan Region have one of the richest pharmacopoeias in the Amazon, playing an important role in the chain of commercialization of native and exotic medicinal plants, whose supply base depends on herbalists in Belém, islands around this region, local middleman and of other regions of Brazil.
Barbosa, Cristiano de Souza; Scudeller, Veridiana Vizoni; Ferreira, Sidney Alberto do Nascimento; Bonatto, Eyde Cristianne Saraiva; Pinto, Ernesto Oliveira Serra	2019	Medicinal plants grown in backyards in the neighborhood of São Raimundo, in the city of Manaus, AM	Revista Terceira Margem Amazônia	Medicinal	AM	The medicinal plant diversity found in urban backyards in the São Raimundo neighborhood demonstrates that residents have a high level of knowledge about medicinal plants in their backyards, mainly due to the alternative use of home remedies. Although Manaus is a city along the lines of globalization, there were several uses for plants in the studied neighborhood, demonstrating an identity of local knowledge in the ethnobotanical knowledge of medicinal plants, which deserve attention and good family farming

						management practices for remain in the urban environment.
Batista, Lídia Patrícia Amim; Brandão, Elias Guimarães; Rosas, Lisandra Vieira; Pinto, Márcia Nascimento; Pantoja, Tatyanna Mariúcha Araújo; Araújo, Tales Vinicíus Marinho; Lima, Renato Abreu.	2019	Survey of medicinal plants used against intestinal parasites and worms in the municipality of Atalaia do Norte-AM	Amazon Biota	Medicinal	AM	It is concluded that this research was of great importance since, through this, the interviewed residents had the possibility to apply their acquired knowledge, and thus leave a legacy for future generations informing the population about diseases of great importance in public health.
Carvalho, Dayanne de Souza; Lima, Renato Abreu; Querino, Carlos Alexandre Santos; Campos, Milton César Costa; Lima, Janaína Paolucci Sales de.	2019	Ethnobotany and Use of Plants with Therapeutic Potential in Brazilian Rural Settlements	Environmental Education in Action	Medicinal	AM	The number of publications regarding studies on medicinal plants in the Amazon region has increased, which indicates the increased interest in these plant species, while having relevance to social, economic, environmental and cultural aspects.
Maia, Marcos Felipe Gonçalves; Giovannini, Baldur Rocha; Viana, Rodney Haulien Oliveira; Ferreira, Gecilane	2019	Breaking Babassu coconut to raise children, dress and put on shoes: Ethnobotany whit Margarida and Maria at Bico do Papagaio, Tocantins, Brazil	Ethnoscientia	Medicinal	TO	We identified a diversity of uses of the plant under analysis, as well as different meanings. For the two women interviewed here, being "Quebradeira de Coco" is more than in profession, it is a sense of existence. They demonstrate a perception of changes in the environment and the importance of work

						in their lives and that of their families. They also highlight the difficulties and sufferings experienced in this work process of more than five decades, breaking coconut to raise children, dress, build houses and eat.
Oliveira, Rodrigo Leonardo Costa de; Almeida, Luís Felipe Paes de; Durigan, Maria Fernanda Berlingieri; Scudeller, Veridiana Vizoni; Barbosa, Reinaldo Imbrozio	2019	Traditional knowledge and uses of Copaíba by the Makuxi Darora community in the savannah of Roraima	Gaia Scientia	Medicinal	RR	Copaifera L. species, popularly known as copaíba, have their oil-resin used in traditional indigenous medicine. Copaiba (Copaifera pubiflora) is used for different purposes in the medicinal (47% of citations), food (7.5%), and mainly those related to wood use (construction, 33%, fuel, 7.5% and technology), 5%) in the community.
Oliveira, Rodrigo Leonardo Costa de; Brito, Sérgio Oliveira de; Almeida, Luís Felipe Paes de; Scudeller, Veridiana Vizoni; Barbosa, Reinaldo Imbrozio	2019	Use and extractivism of Angico in na indigenous community in the Roraima savannah, northern Brazilian Amazon	Environment: Management and Development	Medicinal	RR	Angico is a tree present in the Brazilian phytogeographical domains of the Atlantic Forest, Caatinga, Cerrado and Amazonia. In the northern region of Brazil there are records in the Amazonas, Pará, Acre and the savannah region of Roraima state. This species is used by the indigenous communities for several purposes, among them the medicinal use of the bark and mainly in the construction and fuel with the use of the stem. Statistical analysis indicated that the extraction of

						angico is related to the timber use of the species.

As we can see in the table above, Amazonas and Pará are the two states that most present scientific articles published in the last twenty years in the area of medicinal plants and ethnobotany. This is perhaps due to the fact that these two states have a larger territorial area when compared to other states in the North region and this allows scientific studies to be carried out. Another interesting factor is that most of the journals that published these articles are from Federal Universities in the North region.

In ethnobotanical studies from several Brazilian regions, the majority of informants are women, probably because they are more closely linked to family care (LIMA; MAGALHÃES; SANTOS, 2011). No different in the northern region, considering the important role of women in society, he takes care of the family, takes care of the home and takes care of the children in all ways, thus having a great knowledge of ethnobotanical practices.

Based on the research of the articles, it was found that many scientific articles used semi-structured questionnaires to obtain information about medicinal plants from informants such as healers and midwives (OLIVEIRA et al. 2010). And this is an important factor because it contributed to the inclusion of data from articles, related to medicinal plants in the North Region, available on the Sucupira Platform (NETO; MORAIS, 2003).

The academic history of ethnobotany is mixed with the history of botany and other areas of study in the natural and social sciences, especially anthropology (OLIVEIRA et al. 2009). The study of ethnobotany can not only be confused with the social sciences, in its area of knowledge it has a lot to do with interdisciplinarity which include so many disciplines interconnected with medicine, genetics, ecology, chemistry, which emerged times but that its study and deepening was later referenced.

These sciences drive community socio-economic development and popular participation through their sustainable actions and practices in order to create ecosystem balance, thus keeping the forest intact. According to Vásquez et al. (2014) states that leaf resource availability may be indicative of the high utilization value compared to other parts of the plant, as flowers, fruits and seeds are not available at all times of the year. Indeed, the leaf according to the nature of the plants, it remains for a long time in the plant which is why it is most often used, has a concentration of organic matter and organic substances that can be used to treat diseases such as gastritis, cough, diarrhea, dandruff, anti-inflammatory, infusion skin treatment, a preparation consisting of putting the leaves in the boiled water and then drowning the pan for about 5 or even 10 minutes and taking it in tea form, this is because the leaves and roots should not be boiled.

Medicinal plants are those used in the preparation of medicines. From tea leaves to species cultivated by large pharmaceutical companies for the production of industrialized medicines, they are considered medicinal plants. Due to its great importance, since the 70's, the World Health Organization - WHO has been stimulating the development of medicines with plants (ALMEIDA, 2015).

Due to the lack of population and the prohibitive cost of conventional medicines, which is very high, combining the distances between medical centers and hospitals, the community uses the home remedies available to them and treat your illnesses immediately. According to Lima; Magalhães; Santos (2011), considers the low quality of life of the population and their limited access to local public health programs, making it necessary for them to seek resources for cure or alleviation of diseases, the use of medicinal plants, thus contributing to the recovery of knowledge traditional.

And as a way of encouraging the population to preserve their culture and tradition, which values popular production practices, the use of medicinal plants in the treatment of emerging diseases in different ethnic groups must be implemented in different public health, education and culture policies so that so everyone can consciously use, rescue and preserve these vegetables.

It is a principle and duty of all citizens to protect vegetation in a rational and sustainable way in order to maintain the environmental balance on planet Earth. The environmental dimension is increasingly becoming an issue that, in principle, involves a set of actors from the educational universe, enhancing the engagement of various knowledge systems, the training of environmental professionals and the university community in an interdisciplinary perspective, to address of education for the environment.

Other medicines prepared with medicinal plants have the cheapest cost - herbal medicines - in these the active ingredient is added to other substances of the plant itself, in the form of extract. Who encourages the development of these products, especially in countries where the cost of medicines is very high and rich in biodiversity, as is the case in Brazil (ALMEIDA, 2015). Indeed, the form of production and preparation of medicines through medicinal plants has been a simpler, viable and easily accessible process, using plant organs such as leaves, bark, flowers, fruits and roots by taking advantage of the active ingredient or chemicals they possess.

At the end of the 1970s, the WHO established the Traditional Medicine Program, which recommends that Member States develop public policies to facilitate the integration of traditional medicine and alternative complementary medicine into national health care systems, as well as to promote rational use of this integration. Although modern medicine is well developed in most parts of the world, WHO recognizes that a large part of the population of developing countries depends on traditional medicine for their primary care, as 80% of this population uses traditional practices in their primary care 85% of these use plants or preparations (BRAZIL, 2008).

As a whole, the study of medicinal plants has become an imperative need for society because of the many advantages they have in curing the diseases of the popular. Man is a natural being who sometimes puts himself in the place of being unnatural, because of his attitudes and is endowed with sociocultural and scientific knowledge capable of panicking nature and conserving it in order to make it a harmonious space for him leisure and socializing. In the wild, there are a variety of useful medicinal plant species that are in danger of disappearing as they are being

used unsustainably by man. The Northern Region of Brazil, is not an exception, uses medicinal plants taking advantage of their chemical healing potential and for their food. Some forms of obtaining medicinal plant species marketed in the region, most of them were cultivated in backyards or vegetable gardens (CAJAIBA et al. 2016).

Given the availability of the forest to meet the needs that man has, it is necessary to do it in a more sustainable way (BORBA; MACEDO, 2006) mention that, in case of interest in the commercialization of these plants, they must be cultivated organically, with care especially for the appearance of the morphological aspect, since the Brazilian culture was seriously influenced by this mixture of ethnicities, mixing with the existing knowledge in the country.

The free markets are places of great flow of population and diversified merchandise, historically important places, that were created with the purpose of commercialization of the agricultural products, important place of supply of the amazonense families in inputs, vegetables, dairy products and diverse range of other products that allow for economic stability and improved life (VARGAS et al. 2013).

In each state in the Northern Region, we can find professors and researchers or research centers that work with an ethno-ecological focus. The main institutions are still the Federal Universities, INPA, MPEG, IEPA (Institute of Scientific and Technological Research of the State of Amapá) and Embrapa Units in the North Region. In these institutions, several research and development projects have been carried out, especially with traditional and indigenous peoples (HAVERROTH, 2018).

In Brazil, there are about 65 registered research groups on Ethnobotany/Plant medicinal in the Amazon, of which seven are in the North Region, Amazonas (AM) in Manaus, Roraima (RR) in Boa Vista, Amapá (AP) in Macapá, Pará (PA) in Belém, Tocantins (TO) in Palmas, Rondônia (RO) in Porto Velho and Acre (AC) in Rio Branco, whose common objective is to grow the country and society in general in Science, Technology and Innovation. Table 2 shows the medicinal plants most mentioned in the 37 scientific works belonging to that region.

In addition, the emergence of ethnobotanical collections in Brazil is recent, having identified four collections of this nature in the country that already constitute

as material and immaterial heritage of the institutions to which they are linked and these guarantee future generations the possibility of benefits from the proper use and informed of plant diversity, providing greater study opportunities for the North region (OLIVEIRA-MELO et al. 2019).

Medicinal plants, as well as their uses and indications, are part of the knowledge of Amazonian populations (indigenous and non-indigenous). In the state of Amazonas, medicinal plants are grown in fields, beds, around houses and rural communities and have been sold in open markets and popular markets. The use of medicinal species, most often native to your region, or grown in backyards, can reduce spending on synthetic medicines. This is an aspect that may also be causing the practice of crops in the Amazon region (MERA et al. 2018).

Lima; Pires; Vieira (2014) in their study on medicinal plants and environmental education, affirms that the exchange of knowledge and the appreciation of local culture are fundamental elements that enable practices connected with socio-environmental sustainability. Because the presence of the residents allows the workshops to integrate people and nature. In this way, research and work in environmental education that involve the knowledge related to medicinal plants have the possibility of promoting significant reconnections and triggering more effective socioenvironmental transformations, establishing a rational relationship between the use of plants and the cure of diseases.

Plants are traditionally used by several indigenous communities, with medicinal potential, generating knowledge about their use. Thus, Rocha and Marisco (2016), when conducting a survey of ethnobotanical studies in indigenous communities in Brazil, found that the Northeast region is the one with the highest number of studies, in contrast with the North region of the country, where few studies were carried out performed. The indigenous communities are distributed throughout the Brazilian territory (BRASIL, 2020) with a population number in the North of 305.873 and the Northeast with 208.691 (BRAZIL, 2012). Therefore, based on this distribution, differences can be seen in relation to the number of indigenous people versus the number of ethnobotanical studies in these regions.

Table 2 - Shows the most cited plant species by the authors, their families, common names, parts used, preparation and indications for diseases curable by medicinal plants.

Family / Scientific Name	Common name	Used part	Preparation	Recommendation
Acanthaceae *Justicia calycina* L.	Ampicilina	Leaf, stem	Tea, bath	Inflammation, stomach ache, liver
Justicia pectoralis Jacq	Mutuquinha	Leaf	Tea	Bleeding, headache, earache, cough
Adoxaceae *Sambucus nigra* L.	Sabugueiro	Leaf	Tea, juice and shower	Measles, chicken pox, dengue
Allismataceae *Echinodorus* sp.	Chapéu-de-couro	Leaf	Tea	Cholesterol, diabetes
Amaranthaceae *Alternanthera brasiliana* (L.) Kuntze	Terramicina	Leaf	Tea	Fever, headache, stomach ache
Alternanthera cf. brasiliana (L.) Kuntze	Penicilina	Leaf	Tea	Anti-inflammatory
Alternanthera sp.	Anador	Leaf	Tea	Headache, fever
Beta vulgaris L.	Beterraba	Root	Juice	Anemia
Chenopodium ambrosioides L.	Mastruz	Leaf	Juice, syrup and tea	Worm, flu, cough, stomach ache
Gomphrena globosa L.	Gonfrena	Leaf	Tea	Hemorrhoid
Pfaffia glomerata (Spreng.) Pedersen	Ginseng-brasileiro	Leaf	Juice	Disclaimer
Amaryllidaceae *Allium cepa* L.	Cebola	Stalk	Maceration	Cough, prostate
Allium sativum L.	Cebola-roxa	Stalk	Tea, shower and syrup	Flu, cough, high blood pressure, stomachache and headache
Allium fistulosium L.	Cebolinha	Leaf	Tea	Baby stomach ache
Allium schoenoprasum L.	Cebolinha-francesa	Stalk	Maceration	Insomnia
Anacardiaceae *Anacardium occidentale* L.	Caju	Leaf, bark and fruits	Tea, shower and syrup	Diarrhea, malaria, wounds, stomach ache
Anacardium sp	Cajui	Bark	Maceration	Infection, gastritis
Mangifera indica L.	Manga	Leaf	Tea, shower and syrup	Cough, sinusitis, stomach ache
Spondias mombim L.	Caja	Bark	Tea and maceration	Gastritis, neatness, anti-inflammatory, wash disease
Spondias spp	Aroeira	Leaf and bark	Tea, juice and maceration	Inflammation, ulcer, kidneys, uterus
Annonaceae *Annona mucosa* (Jacq.) Baill.	Biriba	Leaf	Shower	Louse

Annona muricata L.	Graviola	Leaf and stalk	Tea	Inflammation, swelling of pregnant woman, food that is bad, gastritis
Apiaceae *Coriandrum sativum* L.	Coentro	Seeds	Juice	Hoarseness
Eryngium foetidum L.	Chicoria	Leaf and root	Tea and syrup	Flu, diarrhea, stomach ache
Petroselinum crispum (Mill.) Fuss	Tomilho	Leaf	Tea	Poor circulation, headache, soothing
Apocynaceae *Aspidosperma excelsum* Benth	Carapauba	Leaf and bark	Tea and maceration	Inflammation, diabetes, liver, high blood pressure, malaria, wounds, birth control
Couma sp	Sorva	Bark	Tea	Hernia Pains
Geissospermum sp.	Quina quina	Leaf and bark	Tea	Malaria
Himatanthus sucuuba (Spruce ex Mull. Arg.) Woodson	Sucuba	Bark	Tea and shower	Women's bath, stomach pain and urine
Araceae *Caladium* sp	Tinhorão	Leaf	Tea	Shower
Arecaceae *Euterpe precatoria* Mart.	Açaí	Root and fruits	Tea and juice	Anemia, malaria, hepatitis, kidneys, liver
Aristolochiaceae *Aristolochia trilobata* L.	Angelicó	Leaf	Tea	Fever, gastritis, stomach and head pain, vomiting
Aristolochia fimbriata Cham. & Schltdl.	Papo-de-peru	Leaf	Tea	Body softness, laziness
Asteraceae *Acmella oleracea* (L.) RK. Jansen	Jambu	Leaf and flowers	Tea ande syrup	Flu, sore throat tuberculosis
Artemisia vulgaris L.	Artemísia	Leaf	Tea	Malaria, Kidneys, Liver
Bidens cynapifolia Kunth	Picão preto	Leaf and root	Tea	Malaria, Kidneys, Liver
Centratherum punctatum Cass	Perpétua-roxa	Leaf	Juice	Snake bite
Eupatorium triplinerve Vahl	Japana-roxa	Leaf	Tea and syrup	Diarrhea, cough, tufted belly, urine and headaches.
Gymnanthemum amygdalinum (Delile) Sch.bip. ex Walp..	Boldo-africano	Leaf	Tea and juice	Snake bite
Pectis brevipedunculata (Gardner) Sch. Bip.	Chá-de-moça	Root	Tea	Diarrhea, cough, tufted belly, urine and headaches.
Pluchea sagitalis (Lam) Cabrera	Macela	Leaf	Tea and shower	Fever, headache and stomach
Tagetes erecta L.	Cravo-de-defunto	Leaf and flowers	Tea, shower and maceration	Sinusitis, child sickness, bleeding

Bignoniaceae *Fridericia chica* (Bonpl.) .G. Lohmann	Crajiru	Leaf	Tea, shower and juice	Inflammation, avoid child, anemia, healing
Crescentia cujete L.	Cuieira	Leaf, fruits	Tea and shower	Diabetes, Dog Flea
Mansoa alliacea (Lam.) A. H. Gentry	Cipó-alho	Leaf	Tea and shower	Flu, bath, cough, anemia, amoeba, headache
Bixaceae *Bixa orellana* L.	Urucum	Seeds	Tea	Snake bite
Boraginaceae *Heliotropium indicum* L.	Cravo-de-urubu	Leaf	Juice	Infection
Symphytum officinale L.	Confrei	Leaf	Tea and topical use	Cancer, Anemia, Diabetes Scar
Brassicaceae *Brassica oleracea* L.	Repolho	Leaf	Tea and juice	Gastritis, Cholesterol, Diabetes, Scar
Brassica sp.	Mostarda	Leaf	Tea	Child disease
Bromeliaceae *Ananas comosus* (L.) Merril	Abacaxizeiro	Bark and fruits	Tea and syrup	Flu, kidney stone
Cactaceae *Pereskia grandifolia* Haw	Rosa-madeira	Leaf	Tea	Stomach ache, red
Opuntia sp.	Figo-do-diabo	Leaf	Topical use	Bone fracture
Caricaceae *Carica papaya* L.	Mamão	Leaf and flowers	Tea	Worm, liver fat, stomach ache
Caryophyllaceae *Drymaria cordata* (L.) Willd. ex Roem.& Schult	Jaraquicaá	Leaf	Tea	Shower
Celastraceae *Maytenus* spp.	Xixua	Bark	Maceration	Rheumatism, cervix, hernia
Clusiaceae *Clusia nigrolineata* P.F. Stevens	Apui	Leaf	Topical use	Chest pain
Combetaceae *Terminalia catappa* L.	Castanholeira	Leaf	Topical use	Cholesterol
Convolvulaceae *Bonamia ferruginea* (Choisy) Hallier f.	Cipó-tuíra	Leaf and bark	Tea and maceration	Malaria, liver, hepatitis, gastritis
Ipomoea batata L.	Batata	Root	Juice	Gastritis
Ipomoea mauritiana Jacq.	Algodão-bravo	Root	Maceration	Blemish on the skin, mycosis, pain caused by amoebae
Costaceae *Costus cf. spicatus* (Jacq.) Sw.	Cana-de-macaco	Leaf	Tea	Kidneys, liver, hepatitis, gastritis
Crassulaceae *Kalanchoe pinnata* (Jacq.) Sw.	Corama	Leaf	Tea, syrup, juice and topical use	Swelling, sinusitis, tumor, gastritis
Lauraceae *Persea americana* Mill.	Abacate	Leaf, seeds	Tea and maceration	Anemia, sinusitis, cough, hepatitis

Malvaceae *Gossypium barbadense* L.	Algodão	Leaf, seeds	Tea, shower and juice	Inflammation, pneumonia, colic, cough, woman's cleanliness, gastritis
Hibiscus sabdariffa L.	Vinagreira	Leaf	Tea	Sore throat
Malva sp.	Malva	Leaf	Tea	Cough
Melastomataceae *Bellucia grossularioides* (L.) Triana	Araça	Bark	Tea	Gastritis
Meliaceae *Carapa guianensis* Aubl.	Andiroba	Bark and fruits	Tea, topical use and syrup	Flu, cough, stroke, fever, diarrhea, antibiotic
Musaceae *Musa acuminata* L.	Banana-maça	Fruits	Topical use	Angry wound
Musa paradisiaca L.	Banana-pacová	Fruits	Topical use	Angry wound
Musa sp	Banana-baié	Fruits	Shower	Water belly
Myrtaceae *Eucalyptus* sp.	Eucalipto	Leaf	Tea	Diarrhea, flu, sore throat
Eugenia uniflora L.	Pitanga	Leaf	Tea	High pressure
Psidium guajava L.	Goiaba	Leaf, bark and fruits	Tea	Diarrhea, colic, stomach pain
Syzygium aromaticum (L.) Merr. & L.M.	Cravo-da-índia	Bark and fruits	Tea and maceration	Cough, diarrhea, stomach ache, amoeba
Poaceae *Cymbopogon citratus* (DC.) Stapf	Capim santo	Leaf and root	Tea, shower and juice	Soothing, Hair Loss, Stomachache, and Urine
Saccharum officinarum L.	Cana-de-açúcaar	Leaf	Tea	Insomnia
Zea mays L.	Milho	Leaf	Tea	Measles

It was noticed that in the last ten years (2009-2019) the publications of ethnobotany in periodicals grew exponentially in relation to the period from 1999 to 2009. In this sense, research in the area of phytochemistry was of great importance in this scenario, since different parts of the plants can be collected and analyzed chemically for the presence or absence of secondary metabolites and active ingredients that they have aiming at the biotechnological potential of these medicinal plants.

Since the sustainable development of a country depends essentially on a consistent policy of education, science, technology and innovation, based on the preservation of nature, biodiversity and the rational exploration of natural sources necessary for food, social and economic advancement, in a scenario that ensures the maintenance of health and the cure of diseases (FILHO, 2010).

After all, the importance of phytochemical studies in the Amazon is highlighted for the knowledge of plant species through detailed analyzes and studies and observing the metabolic degree that each species presents, knowing its phytochemical properties collaborating with the advancement of scientific studies and providing in a positive way the use of medicinal plants and their therapeutic properties to treat diseases and the search for efficacy and safety in the handling of these studied species (CASTRO; PINTO; LIMA, 2019).

4 FINAL CONSIDERATIONS

Based on the analyzed articles, the research showed that the authors of the published articles are more objective when they show the concern to include ethnobotany and the study of medicinal plants in the northern region of Brazil, as a way of valuing the somewhat touching cultural heritage for the preservation of the forest in its environment. It should be noted that the northern communities still have knowledge and make use of medicinal plants as one of the ways to minimize the suffering they are experiencing to treat their most frequent diseases.

Besides that, knowledge of medicinal plants has been passed down from generation to generation through grandparents, parents, uncles and other knowledgeable older people as their acquisition is easily accessible. People do not have the financial means to buy conventional medicines to treat the primary diseases they suffer because they are very expensive and are far from health centers or medical facilities. Consideration should be given at the time of implementation and use of the natural resource of medicinal plants in the community to sustainably exploit this forest resource so that other generations can enjoy their usefulness to the health of the wider community.

From this study, it can be seen that medicinal plants are used in the northern region of Brazil because the population uses them for the treatment or relief of diseases or symptoms. Thus, the main objective of the research was to survey a

variety of known medicinal plants in the northern region of Brazil through a literature review.

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REFERENCES

ALARCÓN JGS. Levantamento florístico e etnobotânico em um hectare de floresta de terra firme na região do Médio Rio Negro, Roraima, Brasil. [Dissertação] Instituto de Pesquisa Jardim Botânico do Rio de Janeiro, Escola Nacional de Botânica Tropical, 2005, 101 p.

ALBUQUERQUE UP, HANAZAKI N. As pesquisas etnodirigidas na descoberta de novos fármacos de interesse médico e farmacêutico: fragilidades e pespectivas. Revista Brasileira de Farmacognosia. 2006; 16(1): 678-689.

ALMEIDA IA, SOUSA RT. O Benefício das Plantas Medicinais na utilização pelos Professores em Uma Escola Pública. Volume I. Universidade Estadual Londrina – Paraná; 2015, 5p.

BORBA AM, MACEDO M. Plantas medicinais usadas para a saúde bucal pela comunidade do bairro Santa Cruz, Chapada dos Guimarães, MT. Brasil. Acta botânica Brasilica. 2006; 20(4): 771-782.

BRASIL. Instituto Brasileiro de Geografia e Estatística-IBGE. Os indígenas no Censo Demográfico 2010, primeiras considerações com base no quesito corou raça. Rio de Janeiro, 2012.

BRASIL. Fundação Nacional do Índio – FUNAI. Índios no Brasil - Quem São?. Acesso em: 10 de fevereiro de 2020.

CAJAIBA RL, SILVA WB, SOUSA RDNS, ALEX SD. Levantamento etnobotânico de plantas medicinais comercializadas no município de Uruará, Pará. Revista Biotemas. 2016; 29(1): 115-131.

CARNEIRO DB, BARBOZA MSL, MENEZES MP. Plantas nativas úteis na Vila dos Pescadores da Reserva Extrativista Marinha Caeté-Taperaçu, Pará, Brasil. Revista Acta botânica brasílica. 2010; 24(4): 1027-1033.

CASTRO AV, PINTO MN, LIMA RA. A importância de pesquisas fitoquímicas para a Amazônia Brasileira. In: SILVA, JRC, VIANA ÁL, LINS-NETO NFA. editors. Percepção socioambiental nas múltiplas áreas do conhecimento. 1ed. Curitiba: CRV, 2019, p. 201-210.

COSTA RGA. Os Saberes Populares da Etnociência no Ensino das Ciências Naturais: Uma Proposta Didática para Aprendizagem Significativa. Revista Didática Sistêmica. 2008; 8(1): 162-172.

DUTRA MG. Plantas medicinais, fitoterápicos e saúde pública: um diagnóstico situacional em Anápolis, Goiás, Brasil. [Dissertação] Centro Universitário de Anápolis – UniEvangélica. Anápolis; 2009. 30 p.

FILHO RB. Contribuição da Fitoquímica Para o Desenvolvimento de um País Emergente. Química Nova. 2010; 33(1): 229-239.

HAVERROTH M. Ensino e a pesquisa em Etnoecologia e Etnobiologia na Região Norte do Brasil. Ethnoscentia. 2018; 3(2): 1-6.

LEANDRO YAS, JARDIM IN, GAVILANES ML. Uso de Plantas Medicinais nos Cuidados de Saúde dos Moradores de Assentamento no Município de Anapu, Pará, Brasil. Biodiversidade. 2017; 16(2): 30-44.

LIMA RA, MAGALHÃES SA, SANTOS, MRA. Levantamento Etnobotânico de Plantas Medicinais Utilizadas na Cidade de Vilhena, Rondônia. Revista Pesquisa & Criação. 2011; 10(2): 165-179.

LIMA RA, PIRES LSS, VIERA NG. A educação ambiental e o uso de plantas medicinais utilizadas pela população do distrito de União Bandeirante-Rondônia. Revista Eletrônica em Gestão, Educação e Tecnologia Ambiental. 2014; 18(4): 1351-1360.

LÖBLER L, SANTOS D, RODRIGUES EDS, SANTOS NRZD. Levantamento etnobotânico de plantas medicinais no bairro Três de Outubro da cidade de São Gabriel, RS, Brasil. Revista Brasileira de Biociências. 2014; 12(2): 81-89.

MACIEL MAM, PINTO AC, VEIGA JR, GRYNBERG NF, VALDIR FAE. Plantas Medicinais: A Necessidade de Estudos Multidisciplinares. Química Nova. 2002; 25(3): 429-438.

MERA JCE, ROSAS LV, LIMA RA, PANTOJA TMA. Conhecimento, percepção e ensino sobre plantas medicinais em duas escolas públicas no município de Benjamin Constant-AM. Experiências em Ensino de Ciências. 2018; 13(2): 62-79.

OLIVEIRA FCD, ALBUQUERQUE UP, FONSECA-KRUEL, VIVIANE SD, HANAZAKI N. Avanços nas pesquisas etnobotânicas no Brasil. Acta Botânica Brasília. 2009; 23(2): 590-605.

OLIVEIRA-MELO, PAULA MCD, KRUEL-FONSECA, VIVIANE AS, LUCAS FCA, FERREIRA-CEOLHO M. Coleções etnobotânicas no Brasil frente à estratégia global para a conservação de plantas. Boletim do Museu Paraense Emílio Goeldi. 2019; 14(2): 665-676.

ROCHA R, MARISCO G. Estudos etnobotânicos em comunidades indígenas no Brasil. Revista Fitos. 2016; 10(2): 155-162.

RUZZA DAC, GÖTTERT V, ROSSI AAB, DARDENGO JDFE, SILVA IVD. Levantamento Etnobotânico no Municipio de Alta Floresta, Mato Grosso, Brasil. Revista Enciclopédia biosfera. 2014; 10(18): 3331-3343.

SALES MDC, SARTOR EB, GENTILLI RML. Etnobotânica e etnofarmacologia: medicina tradicional e bioprospecção de fitoterápicos. Revista Salus Journal of Health Scienses. 2015; 1(1): 17-26.

SOARES FP, FRAGA AF, NEVES JPO, ROMERO NR, BANDEIRA MAM. Estudo etnofarmacológico e etnobotânico de *Himatanthus drasticus* (Mart.) Plumel (janaguba). Revista Brasileira de Plantas Medicinais. 2015; 17(4): 900-908.

TOMCHINSKY B, MING LC, KINUPP VF, HIDALGO AF, CHAVES FCM. Ethnobotanical study of antimalarial plants in the middle region of the Negro River. Acta Amazonica. 2017; 47(3): 1-10.

VÁSQUEZ SPF, MENDONÇA MSV, NODA SDN. Etnobotânica de plantas medicinais em comunidades ribeirinhas do Município de Manacapuru, Amazonas. Acta Amazonica. 2014; 44(4): 1-16.

VEIGA JB, ESCUDELLER VV. Etnobotânica e medicina popular no tratamento de malária e males associados na comunidade ribeirinha Julião – baixo Rio Negro (Amazônia Central). Revista Brasileira de Plantas Medicinais. 2015; 17(4): 737-747.

VICENTINI A. As Florestas de Terra Firme. In: OLIVEIRA AA, DALY D. (ed.). Florestas do Rio Negro. The New York Botanical Garden, New York; 2001. 143-177.