Ethnopharmacological and botanical evaluation of medicinal plants used by Brazilian Amazon Indian community

Avaliação etnofarmacológica e botânica de plantas medicinais utilizadas em uma comunidade Indígena Amazônica Brasileira

Evaluación etnofarmacológica y botánica de plantas medicinales utilizadas por la comunidad Indígena Amazónica Brasileña

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Abstract: Plants have been widely used to treat many diseases, especially by traditional communities as Indians, that can be considered as an important source of empirical knowledge about the medicinal potential of the Brazilian biodiversity. This study aimed to investigate the use of medicinal plants by a particular Amazon-Indian community named Ikólóéhj (Gavião). The data was obtained based on a semi-structured interview and long-term visits along the indigenous area to harvest the botanical material to subsequent identification and storage in herbarium. In the present work, we identify 23 plant species and three morphospecies, distributed into Ferns / Lycophytes and Angiosperms. In addition, we show that leaves (78%), bark (13%) and roots (9%) were used via maceration (49%), topical use (26%), infusion and bath (13%), and decoction (9%). These plants were used to treat pain, diarrhea, malnutrition, parasites infection, wounds, and snakebites. We also observe that the knowledge about medicinal plants is shared to the older members of the community and this information is transmitted orally to the next generations. Thus, the present study contributes to the regrowth and preservation of knowledge about the use of medicinal plants providing important subsidies for understanding of therapeutic properties of Amazonian plants.

Keywords: Brazilian biodiversity; Amazon plants; traditional communities.

Resumo: As plantas têm sido amplamente utilizadas para tratar de muitas doenças, especialmente pelas comunidades tradicionais como índios, o que pode ser considerado uma importante fonte de conhecimento empírico sobre o potencial medicinal da biodiversidade brasileira. Este estudo teve como objetivo investigar o uso de plantas medicinais por uma comunidade indígena na Amazônia chamada Ikólóéhj (Gavião). Os dados foram obtidos com base em entrevistas semiestruturadas e visitas de longo prazo em toda a área indígena, a fim de coletar material botânico para posterior identificação e armazenamento em um herbário. No presente trabalho, identificamos 23 espécies de plantas e três morfoespécies, distribuídas em samambaias/licófitas e angiospermas. Além disso, mostramos que folhas (78%), casca (13%) e raízes (9%) foram utilizadas para maceração (49%), uso tópico (26%), infusão e banho (13%) e decocção (9%). Essas plantas foram usadas para tratar dor, diarreia, desnutrição, infecções parasitárias, feridas e picadas de cobra. Também observamos que o conhecimento sobre plantas medicinais é compartilhado com os membros mais velhos da comunidade e que as informações são transmitidas oralmente para as próximas gerações. Assim, o presente estudo contribui para o crescimento e a preservação do conhecimento sobre

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o uso de plantas medicinais, fornecendo subsídios importantes para a compreensão das propriedades terapêuticas das plantas amazônicas.

Palavras-chave: biodiversidade brasileira; plantas amazônicas, comunidades tradicionais.

Resumen: Las plantas se han usado ampliamente para tratar de muchas enfermedades, especialmente por comunidades tradicionales como indígenas, que pueden considerarse una fuente importante de conocimiento empírico sobre el potencial medicinal de la biodiversidad brasileña. Este estudio tuvo como objetivo investigar el uso de plantas medicinales por una comunidad indígena en la Amazonía llamada Ikólóéhj (Gavião). Los datos se obtuvieron en base a entrevistas semiestructuradas y visitas a largo plazo en toda el área indígena para recolectar material botánico para su posterior identificación y almacenamiento en un herbario. En el presente trabajo, identificamos 23 especies de plantas y tres especies de morfo, distribuidas en helechos/lycophytes y angiospermas. Además, demostramos que las hojas (78%), la corteza (13%) y las raíces (9%) se usaron para maceración (49%), uso tópico (26%), infusión y baño (13%) y decocción (9%). Esas plantas se usaron para tratar el dolor, la diarrea, la desnutrición, las infecciones parasitarias, las heridas y las mordeduras de serpientes. También observamos que el conocimiento sobre las plantas medicinales se comparte con los miembros mayores de la comunidad y que la información se transmite oralmente a las próximas generaciones. Por lo tanto, este estudio contribuye al crecimiento y la preservación del conocimiento sobre el uso de plantas medicinales, proporcionando importantes subsidios para comprender las propiedades terapéuticas de las plantas amazónicas.

Palabras clave: biodiversidad brasileña; plantas amazónicas, comunidades tradicionales.

1 INTRODUCTION

The range of interactions between humans and plants dates back to antiquity and the use of natural resources was essential to guarantee the survival of civilizations. On this way, the development of humanity depended on the various forms of knowledge and use of plant resources, what were improved by the populations, determining both the landscape configuration and the characteristics of each culture (GANDOLFO; HANAZAKI, 2011; RANGEL, 2009).

Brazil has one of the highest rates of biological diversity in the world and is considered one of the highest cultural diversity countries, especially regarding the diversity of indigenous ethnicities, which are currently spread over 500 areas, inhabited by about 200 culturally different societies (DIEGUES, 2000).

Indigenous people are distributed by significant portion of the forests of the Amazon region, owning about 110 million hectares, corresponding to 12.5% of the Brazilian territory (CRISOSTOMO *et al*., 2015). According to data from *Instituto Brasileiro de Geografia e Estatística* (IBGE [Brazilian Institute of Geography and Statistics], 2012) in 2010, there were 896.9 thousand of Indians in Brazil, 36.2% in urban areas and 63.8% in rural areas. The total includes 817.9 thousand indigenous people, and also 78.9 thousand people who lived in indigenous lands and declared themselves of another color or race.

The Igarapé Lourdes indigenous territory, located in Ji-Paraná, Rondônia state, Brazil, has a territorial extension of 185,534 hectares, approved by Decree n. 88,609 of August 11, 1983, and is inhabited by Ikólóéhj and Karo indigenous ethnic groups (CARDOZO; VALE JUNIOR, 2012).

Situated in the Igarapé Lourdes indigenous territory, Cacoal community is occupied by Ikólóéhj ethnicity and consists of 13 families, in a total of 78 individuals. They are speaking Tupi-Mondé and Portuguese languages, however, someone, especially older women and men, have difficulty speaking Portuguese (CARDOZO; VALE JUNIOR, 2012). Despite access to conventional medicine, the use of plants represents an important strategy to treating the most common diseases in the community. The knowledge about these medicinal plants is transmitted mainly orally to the next generations by the indigenous savant.

Studies on the traditional use of plants in indigenous communities of Amazon are scarce, due to the difficulty of access to indigenous territories, limitations on the knowledge of the language of the different ethnic groups and the difficulty in formal identification of the plant species, which in many cases is only known in the communities by name in the native language.

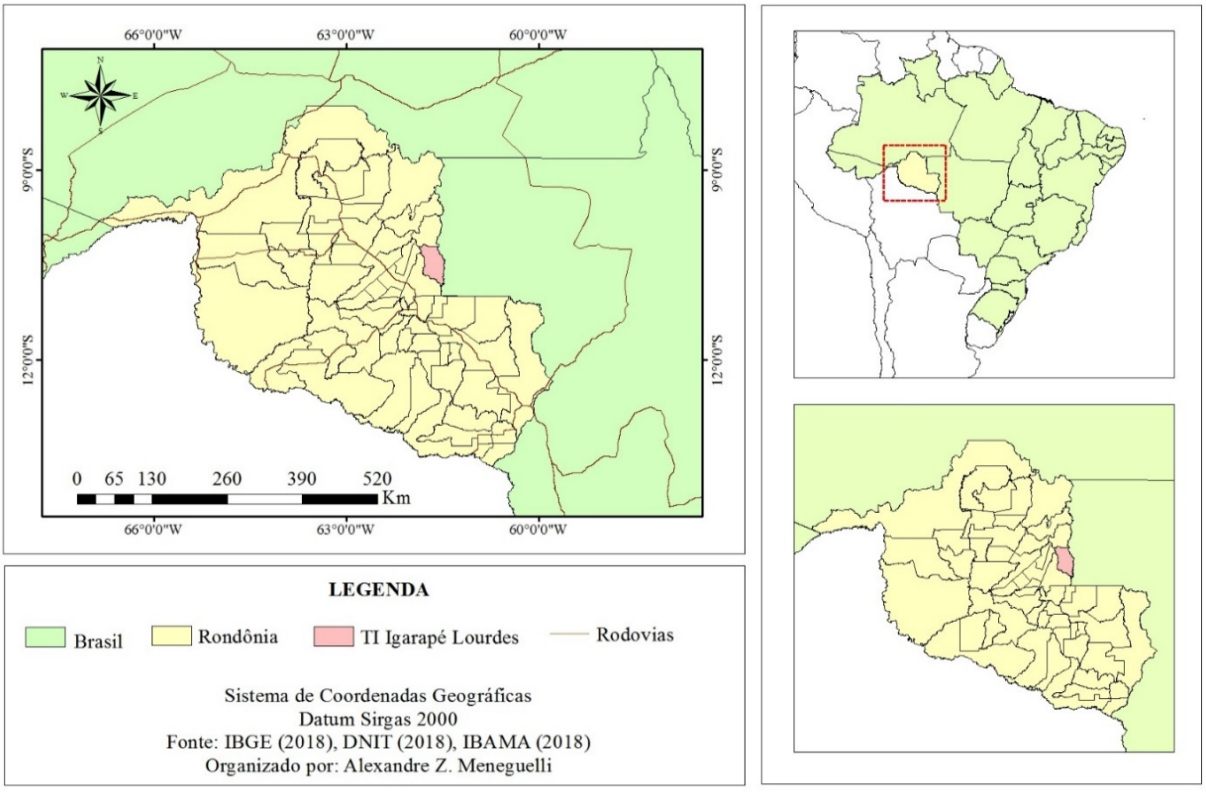
In this context, this study aimed to conduct a survey on the medicinal plants used by Ikólóéhj (Gavião) ethnic group in the community of Cacoal, specifically on the indigenous land Igarapé Lourdes. It is expected that this work would help to elucidate the therapeutic indications and the ways of preparation of the medicinal plants more widely used by this community, as well as to compare the information obtained in our studies with data from the scientific literature.

2 MATERIAL AND METHODS

2.1 Research Local

The work was carried out at Igarapé Lourdes Indigenous Land, located in the Cacoal Community (Figure 1), with Ikólóéhj ethnic group that inhabits this area. The area is located approximately 58 km from the municipality of Ji-Paraná, in the state of Rondônia.

Figure 1 – Igarapé Lourdes Indigenous Land, located in the municipality of Ji-Paraná, state of Rondônia



Source: IBGE (2018), DNIT (2018), IBAMA (2018), Organized by Alexandre Zandonadi Meneguelli.

2.2 Authorizations

All authorizations required to conduct the research were obtained as required by Normative Instruction 01 / Presidency of November 29, 1995 and Administrative Proceeding No.

08620.142826 / 2015-44. The Indigenous Land Entry Authorization (number 7 / AAEP / PRES / 2018) was granted on January 22, 2018, effective from January 29, 2018 to June 20, 2020. The registration was also made with the National System of Management of Genetic Heritage and Associated Traditional Knowledge (SISGEN), in compliance with Law No. 13,123 / 2015 and its regulations (number A4B2495, December 27, 2017). The SISGEN registration number was also sent to the *Fundação Nacional do Índio* (FUNAI [National Indian Foundation]). As determined by Brazilian law, the project was submitted and approved by the *Comissão Nacional de Ética em Pesquisa* (CONEP [National Research Ethics Commission]), according to opinion number 2.356.262, of October 31st, 2017.

2.3 Plant collection, identification and herborization

To the ethnobotanical and pharmacological survey were used semi-structured interview (Supplementary Material), with information about local illnesses, herbal remedies, part of plant used, method of prepare, popular name in the indigenous language and therapeutic indications. Plant harvests were carried out in five, long-term visits along the indigenous area guided by the indigenous savant and an indigenous teacher responsible for translating the Tupi-Mondé language into Portuguese. The plants indicated as medicinal were photographed and the botanical material collected to make exsiccates for later identification and deposit in the Herbarium Botanical Collection Dr. Ary Tupinambá Penna Pinheiro, from Centro Universitário São Lucas, Porto Velho, Rondônia, Brazil.

Plant species were identified according to standard taxonomic methods, based on floral morphological characters and analytical keys. The plant species were grouped into Families according to the classification system of the Brazilian Flora Species List (BFG, 2018). The samples were identified by the parataxonomist José Ramos of the *Instituto Nacional de Pesquisas da Amazônia* (INPA). Corrections to plant names in the indigenous language were made by indigenous professor José Palahv Gavião. For corrections to scientific names and families, a conference search was conducted on the official website of the Brazilian Flora Species List and the Missouri Botanical Garden.

The therapeutic uses of the plants by Gavião community were classified according the International Code of Diseases and Health Related Problems (ICD-10, 10th edition).

3 RESULTS

The investigation of plants with therapeutic application was conducted by guided tour, which consists in substantiating and validating the names of plants cited in interviews of the community members, using the method of species recognition by vernacular names indicated by the indigenous savant (ALBUQUERQUE; LUCENA; ALENCAR, 2010). It is important to highlight that the popular names may change according to the place and ethnicity consulted.

The ethnopharmacological research resulted in 23 plant species and 3 morphospecies with indications of medicinal use by the indigenous of Gavião community. These species are distributed into Ferns / Lycophytes and Angiosperms. Among the Angiosperms, the families identified were: Apocynaceae, Aracaceae, Bignociaceae, Celastraceae, Chrysobalanaceae, Connoraceae, Erythroxylaceae, Fabaceae, Icacinaceae, Malvaceae, Meliaceae, Menispermaceae, Moraceae, Piperaceae, Veraceae, Moraceae, Piperaceae. The botanical families, Celastraceae, Chrysobalanaceae and Menispermaceae stood out with two species mentioned as medicinal.

Among the parts of the plants used for therapeutic purposes, the leaves were the most indicated (15 occurrences), followed by the fresh leaves (03 occurrences), the roots (03 occurrences), bark (02), stem (01), root peel (01) and potato (01) with only one indication. Regarding the ways of plants preparation, maceration was the most cited (17), followed by infusion (03), topical use (03) and decoction (02) and chewing (01).

The reports on the purpose of plant use were diverse, however, the use for the treatment of diseases related to digestive system disorders (diarrhea), endocrine diseases, nutrition and metabolism, injuries, poisonings and other consequences of external causes (wound healing), infectious and parasitic diseases (worms) were the most cited during the study.

Table 1 – Medicinal plants used in the Cacoal community

Herbarium Registry	Family/Scientific Name	Indigenous name	Part of the plant	Preparation	Therapeutic use (CID-10)
	HYMENOPHYLLACEAE				
7771	*Trichomanes pinnatum* Hedw.	Goéhjsev	Leaf	Maceration	Digestive System Disorders
	APOCYNACEAE				
7772	*Geissospermum reticulatum* A.H.Gentry	Djíhn Sev	Leaf	Maceration	Undefined conditions or pains
	ARACEAE				
7773	*Monstera spruceana* (Schott) Engl.	Vazzer Va Sev	Leaf	Infusion	Undefined conditions or pains
	BIGNONIACEAE				
7774	*Fridericia nigrescens* (Sandwith) L. G. Lohmann	Vahjá Péuhn	Leaf	Maceration	Endocrine, nutrition and metabolism disorders
	CELASTRACEAE				
7775	*Cheiloclinium cognatum* (Miers) A.C.Sm.	Aliádág	Stalk	Maceration	Digestive System Disorders
S/N	*Tontelea micrantha* (Mart.) A.C. Sm.	Aliadaàg póhj	Leaf	Maceration	Digestive System Disorders
	CHRYSOBALANACEAE				
7776	*Couepia bracteosa* Benth.	Básev Abi Kórkor	Bark	Maceration	Digestive System Disorders
7777	**Parinari montana* Aubl.	Basev Abi Kórkor Sev	Bark of the Root		
	CONNARACEAE				
7778	*Rourea camptoneura* Radlk.	Boliria	Bark	Maceration	Injury, poisoning and other consequences of external causes
	ERYTHROXYLACEAE				
7779	*Erythroxylum macrophyllum* Cav.	Maxah Kihr	Root	Maceration	Infectious and parasitic diseases
	FABACEAE				
7780	*Vatairea sericea* (Ducke) Ducke	Gérev Sev	Leaf *in natura*	Chewing	Undefined conditions or pains
	ICACINACEAE				
7781	*Casimirella ampla* (Miers) R.A.Howard	Babúgaá	Potato	Maceration	Endocrine, nutrition and metabolism disorders
	MALVACEAE				
7782	**Herrania mariae* (Mart.) Decne. ex Goudot	Bajíhj Xóhgá Ìhv	Leaf	Maceration	Injury, poisoning and other consequences of external causes

Herbarium Registry	Family/Scientific Name	Indigenous name	Part of the plant	Preparation	Therapeutic use (CID-10)
	MELIACEAE				
7783	**Trichilia catigua* A.Juss.	Zaj Tapoh	Leaf *in natura*	Maceration	Endocrine, nutrition and metabolism disorders
	MENISPERMACEAE				
7784	*Abuta sandwithiana* Krukoff & Barneby	Baséa Dov Kav Ìhv	Bark	Maceration	Skin and Subcutaneous Cell Tissue Diseases
7785	*Anomospermum grandifolium* Eichler	Pazá Tíh Vára Sev	Leaf *in natura*	Maceration	Digestive System Disorders
	MORACEAE				
7786	*Brosimum lactescens* (S.Moore) C.C.Berg	Bóttih (Oiti)	Root	Infusion	Endocrine, nutrition and metabolism disorders
	PIPERACEAE				
7787	*Piper plurinervosum* Yunck.	Djoli Pehv Sev	Leaf	Bath, Topic use	Diseases of the musculoskeletal system and connective tissue
	QUIINACEAE				
7788	*Quiina amazonica* A.C.Sm.	Gáh rúhv	Leaf	Decoction	Infectious and parasitic diseases
	RHAMNACEAE				
7789	*Ampelozizyphus* Ducke	Ijó Sev	Leaf	Maceration	Undefined conditions or pains
	RUBIACEAE				
7790	*Psychotria* L.	Pekóa Sev	Leaf	Topic use	Injury, poisoning and other consequences of external causes
	RUTACEAE				
7791	*Ticorea tubiflora* (A.C.Sm.) Gereau	Ikoloehj Piaja Sev	Leaf	Infusion	Endocrine, nutrition and metabolism disorders
	SMILACACEAE				
7792	*Smilax rufescens* Griseb.	Valutúg	Leaf	Chewing	Endocrine, nutrition and metabolism disorders
	STEMONURACEAE				
7793	*Discophora* Miers	Maxápo	Leaf	Maceration	Infectious and parasitic diseases
	STYRACACEAE				
7794	**Styrax macrophyllus* Schott ex Pohl	Bosojá Sev	Leaf	Maceration	Injury, poisoning and other consequences of external causes
	VERBENACEAE				
7795	**Petrea volubilis* L.	Ijahj Népo Sága Sev	Leaf	Maceration	Undefined conditions or pains

Source: The authors.

The present study was the first, in the state of Rondônia, to register the occurrence of the following species: *Herrania mariae* (Mart.) Decne. ex Goudot, *Parinari montana* Aubl., *Trichilia catigua* A.Juss., *Styrax macrophyllus* Schott ex Pohl and *Petrea volubilis* L., according to the Brazilian Flora Species List (BFG, 2018).

4 DISCUSSION

Ethnobotanical studies investigate the relationship between traditional populations and plants, aiming at understanding other cultural discourses, their way of life, codes and customs (COTTON, 1996; ALBUQUERQUE, 2000). This gives ethnobotany great relevance to regional populations for the exploration and management of natural resources to obtain medicines, food and raw materials (FERRO, 2006). In the Cacoal community, where Ikólóéhj (Gavião) Indians inhabit, the plants are used in traditional medicine, as well as serving other purposes such as food, dyeing for body painting in traditional and religious festivities, dyeing for household utensils, handicrafts for personal use and marketing. Given the wide application of botanical resources by traditional communities, the present study carried out a survey of the most used species in the Cacoal community, with their respective therapeutic applications, the parts of the plant used and preparation. In addition, it was possible to formally identify the species evaluated.

The work resulted in 23 plant species and 3 morphospecies with indications of medicinal use by indigenous people. It is noteworthy that not all known plants were indicated by the indigenous savant, especially those with abortive properties, considering that sharing such knowledge could bring risks to the community.

Regarding the structure of the plant used for medicinal purposes, the leaves are the most indicated (70%), but it was reported the use of bark, roots and stems. It is widely described that leaves are important sources of secondary metabolites with pharmacological activities, such as essential oils, sesquiterpene lactones, phenolic acids, flavonoids, coumarins, saponins, alkaloids, tannins, glucosinolates, cyanogenic glycosides, among others (GOBBO-NETO; LOPES, 2007).

Although the use of these plants in the Cacoal community occurs in an extractive manner, the reports presented by the indigenous savior, showing vast knowledge about the forms and periods of collection of botanical material, suggesting that the collection is made sustainably in order to minimize damage to species.

Although most indigenous communities in Brazil, currently, have access to allopathic medicines, the use of medicinal plants still occupies a prominent place in the treatment of the most common diseases in these populations. The knowledge and indication of medicinal plants are usually attributed to an older and more experienced member of the community, who, in the Cacoal community of the Ikólóéhj ethnic group, is called an indigenous savant. Beyond to his role in indicating plants for disease treatment, he is indispensable for the perpetuation of traditions through the transmission of knowledge to younger natives.

The reports on the purpose of plant use were diverse, however, they are used for the treatment of diseases related to digestive system disorders (diarrhea), endocrine diseases, malnutrition, injuries, poisonings and other consequences of external causes (wound healing), infectious and parasitic diseases (worms) were the most cited during the study.

Although the use of the reported plants is well established in the Cacoal community, researches on the therapeutic properties of these species are incipient or nonexistent. When comparing our data with the literature, we observed that the proposed medicinal use for plants by the indigenous savant in Cacoal community, in most cases, is not corroborated by the literature. As described in Table 1, among the 23 plant species and 03 morphospecies reported in our study, only for six of them (*Trichomanes pinnatum* Hedw, *Geissospermum reticulatum* AHGentry, *Casimirella broad* (Miers) RAHoward, *Abuta sandwithiana* Krukoff & Barneby, *Smilax rufescens*

Griseb and *Petrea volubilis* L.) have been found demonstrating their phytochemical characteristics and pharmacological properties. In some cases, other species of the genus mentioned in our study, occurring in other regions of Brazil or in other countries, had their properties evaluated, as shown for: *Vatairea sericea, Monstera spruceana, Ampelozizyphus* sp; *Petrea volubilis; Vatairea macrocarpa, Fridericia nigrescens* (Sandwith) L. G. Lohmann, *Cheiloclinium cognatum* (Miers) A.C.Sm, *Tontelea micrantha* (Mart.) A.C. Sm, *Couepia bracteosa* Benth, *Rourea camptoneura* Radlk, *Erythroxylum macrophyllum* Cav, *Vatairea sericea* (Ducke) Ducke, *Trichilia catigua* A.Juss. *Anomospermum grandifolium* Eichler, *Brosimum lactescens* (S.Moore) C.C.Berg, *Piper plurinervosum* Yunck, *Quiina amazonica* A.C.Sm, *Ampelozizyphus* Ducke, *Psychotria* L, Gereau, *Smilax rufescens* Griseb, *Styrax macrophyllus* Schott ex Pohl and *Discophora* Miers. Still, for other plants used for medicinal purposes in the Cacoal community, only the family was studied *Herrania mariae* (Mart.) Decne. ex Goudot and *Ticorea tubiflora* (A.C.Sm.).

Our results suggest that, although research on Brazilian biodiversity is expanding, there is still a large gap between traditional knowledge and scientific demonstrations of plant pharmacological properties. Also, when comparing the data obtained in this study regarding the therapeutic indication of plants in Cacoal community with the specialized literature, it was observed that in most cases the traditional use and scientific demonstrations are diverse, although some data may suggest the therapeutic effect of species in question.

In this context it was reported by the indigenous savant of the Cacoal community the use of various species (*Vatairea sericea, Geissospermum reticulatu, Monstera spruceana, Ampelozizyphus* sp. and *Petrea volubilis*) for the purpose of treating pain of various etiologies. Thus, *Vatairea macrocarpa* has been shown to have compounds capable of suppressing the synthesis of pro-inflammatory mediators (ALENCAR *et al*., 2006). Studies on the phytochemical and pharmacological properties of *Geissospermum reticulatum* have shown that extracts of this plant are provided with anti-tumor and antioxidant activity (SAJKOWSKA-KOZIELEWICZ *et al*., 2016). Regarding the genus *Ampelozizyphus*, it has been shown that the aqueous extract of *A. amazonicus* is immunomodulatory and anti-inflammatory (PEÇANCHA *et al*., 2013). Another strategy employed by the Cacoal community natives to treat pain is the leaves of *Monstera spruceana*, prepared by infusion. Although no studies showing the pharmacological effect of this species have been found, it has been shown that *Philodendron bipinnatifidum* of the Araceae family, which belongs to *M. spruceana*, has analgesic and anti-inflammatory activities related to the presence of flavonoids and phytosterols (SCAPINELLO *et al*., 2019).

Taken together, these data may constitute a scientific basis for the use of these species in Cacoal Community, as pain represents one of the cardinal signs of inflammation and anti-inflammatory drugs are provided with analgesic action (SCAPINELLO *et al*., 2019).

The plant species *Piper plurinervosum* is indicated in Cacoal community for treatment of joint inflammation. This use may be related to the anti-inflammatory properties already demonstrated for many species of the *Piper* genus, which, due to their complex photochemical composition, they are used in the treatment of urological problems, skin, liver, stomach diseases, wound healing and as antipyretic agents. and anti-inflammatory drugs, as well as acting as natural antioxidants and antimicrobial agents (SALEHI *et al*., 2019).

Another frequent use of plants evidenced in our study in Cacoal community is as a source of nutrients, especially for children with signs of malnutrition. In this context, *Fridericia nigrescens, Casimirella ampla* and *Ticorea tubiflora* species were prepared by maceration or infusion.

Corroborating the traditional use of *Casimirella ampla*, it has been shown by Ribeiro (2018) that the extract produced from the starch of *Casimirella* spp. has higher calcium, copper, iron, manganese and zinc concentrations than cassava and potato starch. For the other plants indicated for the purpose of mitigating malnutrition, the studies found do not correlate directly with these properties, but show that they are special with high therapeutic potential. Thus, Brandão *et al.* (2017) demonstrate that extracts of leaves, stems and fruits of *Fridericia formosa* have antiviral activity, being considered of interest for the development of new antiviral drugs. Regarding *Ticorea tubiflora*, there are no data on its pharmacological properties, however, Campelo *et al*. (2013) demonstrated species from the Rutaceae family, such as *Citrus limon*, were able to reduce urea, triglyceride and uric acid levels and improve renal function, probably due to the presence of monoterpenes.

In this study was showed that many plants are used to improve muscle strength and disposition in both adults and children. The species reported for this purpose were *Trichilia catiguá* and *Smilax rufescens*. In a research with *Trichilia catigua*, it was shown that the crude extract has analgesic, anti-inflammatory and neuroprotective effect (TRUITI *et al*., 2015). Although *Smilax rufescens* is little known, numerous pharmacological properties have been described for the genus *Smilax*, such as anti-inflammatory, analgesic, antioxidant, antimicrobial action, justifying its benefit in many clinical conditions.

In Cacoal community, diarrhea is highly prevalent, especially in children. In this condition the following species are employed for this purpose: *Cheiloclinium cognatum, Tontelea micranta, Couepia bracteosa* and *Parinari montana*. *Cheiloclinium cognatum* has been shown to have compounds such as tingenone and tingenol with activity against *Entamoeba histolytica, Giardia lamblia, Trichomonas vaginalis* and *Trypanosoma cruzi* (ROCA-MÉZQUITA *et al*., 2016), which could substantiate the effectiveness of its use in diarrhea, especially those caused by worms. However, on suspicion of worms, the treatment suggested by the indigenous savant in Cacoal community is made with macerated *Erythroxylum macrophyllum* and *Discoplhora* Miers. According to Macedo *et al*. (2016) *Erythroxylum suberosum* extract is provided with antitumor activity, but no references to antiparasitic action of the genus were found. For other species the studies show different effects from that attributed by the traditional knowledge of the indigenous people. *Tontelea micranta* has been described as rich in alkaloids, flavonoids, terpenoids and tannins, indicating its potential for prospecting new products of pharmaceutical interest (MERCADANTE-SIMÕES *et al*., 2014). Likewise, *Couepia bracteosa* has phenolic and carotenoid compounds with great potential for application to human health, especially against oxidative damage (BERTO *et al*., 2015). For the *Parinari montana* species, no data on their therapeutic properties were found, however, study with *Parinari congensis* demonstrated that the hydroalcoholic extract of leaves, stem and spikelet has activity against *Plasmodium falciparum* and *Plasmodium berghei* (LARYEA; BORQUAYE, 2019).

The use of plants to induce wound healing is also a common practice in Cacoal community, with *Rourea camptoneura* and Psychotria L. being indicated. Although this effect is not yet scientifically proven, it has been shown that the aqueous extract *Rourea induta* has analgesic action. related to the inhibition of release of inflammatory mediators (KALEGARI *et al*., 2014), which may correlate with their healing potential.

In addition to the diseases described above, numerous other conditions that affect the members of Cacoal community have been reported, such as snakebite accidents, for which *Herrania mariae* is employed. Similar to that observed with other plants reported in our study, no data corroborating this use were found, but according to data from Tian et al. (2019), in a

study conducted with the Malvaceae family, the leaves of the species *Abutilon theophrasti* have compounds with anti-inflammatory action. Since in the snakebite accident, especially caused by *Bothrops* snakes, responsible for most cases of poisoning, the inflammatory response is responsible for the damage caused by the poison (JORGE *et al*., 2019).

5 CONCLUSION

The data of this study were obtained according to the highest values of importance concerning medicinal use of plants in Cacoal community, ensuring the great information about ethnobotanical profile of medicinal plants of this region. The preservation of culture and the practice of traditional medicine themselves represents important strategies for sustenance of indigenous culture, especially because the knowledge about medicinal plants is mainly restricted to the older members of the community and transmitted orally through to the next generations. Thus, the present study contributes to the regrowth and preservation of knowledge about medicinal plants in Cacoal Village, as well as, providing important subsidies for comprehension of therapeutic properties of Amazonian plants, supplying valuable information for support bioprospection of new drugs, since despite the largest biodiversity, few innovative products have been developed in Brazil from active constituents derived from the Brazilian biodiversity.

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Note: The present work aims to evaluate the use of medicinal plants in the Gavião village, with a survey of the main plant species used therapeutically, and to compare this use with data available in the specialized literature. Therefore, it was necessary to set up a multidisciplinary research group to assess the different aspects of the work. Thus, professionals with knowledge in the fields of Botany, Pharmacology, and Phytochemistry also participated in the study, so that we could discuss the data collected more comprehensively. Contributions: Alexandre Zandonadi Meneguelli – student of the Doctoral Course in Biotechnology at the Universidade Católica Dom Bosco (UCDB); Ely Eduardo Saranz Camargo – co-supervising researcher, performed the survey of the pharmacological activities of the plants listed in the study, due to his experience in the area of Pharmacology and Medicinal Plants; Danieli Fernanda Buccini – performed the survey of the pharmacological activities of the plants listed in the study, due to her experience in the area of Pharmacology and Medicinal Plants; Beatriz Cardoso Roriz – acted in the survey of the pharmacological activities of the plants listed in the study, due to her experience in the area of Pharmacology and Medicinal Plants; Gabriela Ramos Cerqueira – assisted in the work of data collection in the field and in the process of formal identification of plant species, due to her experience in the area of Plant Systematics; Susana Elisa Moreno – guiding researcher.