

ANTIPARASITIC PLANTS USED BY THE KANTARURÉ-BATIDA INDIGENOUS COMMUNITY (NE-BRAZIL): ETHNOBOTANY AND LOCAL KNOWLEDGE-EROSION RISKS¹

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1 Introduction

Indigenous peoples traditionally have complex and close relationship with natural resources, mainly with vegetables, since time immemorial. Such relationship is favored by historical, cultural and environmental aspects surrounding them. Thus, indigenous peoples are one of the largest and most reliable empirical knowledge sources (SANTOS; ARAÚJO; BATISTA, 2010; HAVERROTH, 2013). The traditional botanical knowledge acquired by indigenous peoples, mainly by oral transmission, enabled them to use plants for different purposes such as body paintings (GRUPIONI, 2009), self-sufficiency in food production (PEDREIRA et al., 2013), religious rites (LUNA, 2011) and cure of diseases (AHMED; AKHTAR, 2016). The medicinal use of plants stands out among the aforementioned purposes because it is intrinsically linked to quality of life and to health promotion (NETO et al., 2014; MUGISHA et al., 2014).

According to the United Nations (2010), there are approximately 370 million indigenous people, who belong to 5,000 ethnic groups; thus, they represent most of the world's cultural diversity. The use of plants for disease treatment purposes in Brazil - a country that hosts a wide variety of native plants and more than 817 thousand indigenous individuals (IBGE, 2010; COAN; MATIAS, 2013) - dates back to the pre-colonial period, when forests were the main source of medicines to Amerindians, as well as to the post-colonial period, when herbal medicines were essential to the treatment of several epidemic diseases. Nowadays, plants remain important therapeutic elements of health and illness profiles (SILVA; FREIRE, 2013; BRANDELLI et al., 2013; FRAUSIN et al., 2015).

Surveys on the use of medicinal flora by indigenous people living in the Brazilian Northeastern region, which houses 25% of the Brazilian natives (FUNAI, 2016a), were conducted with Tapeba (MORAIS et al., 2005), Kambiwá (SANTOS; ARAÚJO; BATISTA, 2010), Pataxó (CUNHA LIMA et al., 2012), Fulni-ô (ALBUQUERQUE et al., 2011a) and Potiguara (LEITE; MARINHO, 2014) tribes. Results showed that plants are a valuable source of cure for these groups, because a broad spectrum of them was indicated to treat 143 different health issues. However, since these studies just conducted general surveys for any dysfunctions, only 3% of the species were registered as medicinal plants capable of treating one of the main morbidity and mortality causes among indigenous people, namely: intestinal parasitosis (BASTA; ORELLANA; ARANTES, 2012).

The high prevalence of parasitic diseases among indigenous people has been associated with lack of basic sanitation, inadequate water treatment, coexistence with animals, as well as with hygiene, food and cultural habits (FONTBONNE et al., 2001; RIOS et al., 2007; BÓIA et al., 2009). These factors contributed to high contamination and reinfection levels, mainly by helminths (*Ascaris lumbricoides* Linnaeus 1758; *Schistosoma mansoni* Pirajá da Silva 1908 and hookworms) and protozoa (*Entamoeba* sp. and *Giardia* sp.), which are often found in indigenous villages and may result in serious health issues, as well as to death (PALHANO-SILVA et al., 2009; ASSIS et al., 2013; CERQUEIRA; SILVA; BOLPATO, 2013). Therefore, this picture depicts the low health care level in indigenous societies, which present higher disease and mortality rates than other segments of the national population (COIMBRA JÚNIOR; SANTOS, 2000; BRASIL, 2002),

mainly when it comes to the frequency and incidence of parasitosis, since they are often diagnosed in indigenous people, as shown in the study entitled “Estado da arte sobre enteroparasitos em comunidades indígenas do Brasil” (State of the art on enteroparasites in Brazilian indigenous communities) (SANTOS-LIMA; PEREIRA; DIAS-LIMA, 2017).

In light of the negative impact intestinal parasitosis have on the health of indigenous peoples, and due to the need of conducting studies to help better understanding, salvaging and spreading the knowledge of indigenous peoples living in Northeastern Brazil, the aim of the current research was to survey antiparasitic plants used in the medical system of the Kantaruré-Batida indigenous people and to investigate whether their ethno-medico-botanical knowledge is transmitted within the community.

2 Material and methods

2.1 Study site

The Kantaruré community is located in the rural area of Glória County, Northeastern Bahia State, in the ecoregion known as Raso da Catarina, close to the Northern side of Serra Grande, approximately 5 km from the right bank of São Francisco River (BRASILEIRO, 2003). The territory was officially homologated in 2001; it covers 1,811 hectares (FUNAI, 2016b) and houses two indigenous villages - Batida and Baixa das Pedras -, which are settled 3 km away from each other.

The Batida group, which is the matrix of the Kantaruré ethnic group, as well as the current object of study, is located 33 km away from Glória County, and 510 km away from Bahia State capital, Salvador, at geographic coordinates 9°09'13.07" S and 38°22'51.04" W (Figure 1). Its population comprises approximately 46 families, thus totaling 340 indigenous individuals (LIMA, 2014), whose main subsistence forms lie on agriculture, hunting and plant extractivism.

The area is phytogeographically characterized by semi-arid hot climate with low rainfall incidence and mean annual temperature 25°C; it presents caatinga vegetation with shrubby physiognomy, as well as predominantly sandy and poorly fertile soil (VELLOSO; SAMPAIO; PAREYN, 2002; PREFEITURA MUNICIPAL DE GLÓRIA, 2014).

2.2 Ethical and legal aspects of the research

The current study was previously approved by the Ethics Committee on Human Research of Bahia State University (UNEB - Universidade do Estado da Bahia), CAAE N. 111009812.0.0000.0057, besides being authorized by community leaders after meetings were held to present the research goals. Next, visitations were made to the indigenous village to allow us to get closer to the residents and to learn about their socio-cultural singularities, as well as to inform them about the goals of the current study and to invite them to participate in it. Those who agreed to be part of the research, signed the Informed Consent Form (ICF), as recommended in the guidelines of the National Health Council Resolution N. 466/12 (BRASIL, 2013).

Figure 1 – Location of indigenous Community Kantaruré-Batida, Glória County, Bahia State, Brazil.



Source: Prepared by the authors

2.3 Selecting participants and collecting data

The herein selected sample comprised local experts (tribal chiefs, community leaders, midwives and prayers) contacted through the snowball technique (BAILEY, 1994), as well as one representative from each family. Data were collected through semi-structured interviews and through the free listing of species (BERNARD, 2006), which were individually applied during visits paid to participants' homes. The first technique was focused on knowing the participants' profile and the methods they adopted to treat parasites, as well as on investigating the use of medicinal plants and whether there was knowledge dissemination. The second technique was focused on identifying plants used as antiparasitic medicine, the used parts, as well as how they were prepared and administered.

2.4 Botanical material collection and identification

The indicated ethnospecies were collected from February 2014 to January 2016, and it totaled 12 field trips to perform bimonthly collections in vegetation areas adjacent

to the respondents' houses, as well as in the Serra Grande area belonging to the Kantaruré territory. The identification of plants in the field was performed by the tribal chief, based on the guided tour technique (PHILLIPS; GENTRY, 1993).

The botanical material was collected, processed and herborized according to the methodology by Fosberg and Sachet (1965) and Mori et al. (1985). Subsequently, it was identified and deposited in the Herbarium of Bahia State University (HUNEB - Herbário da Universidade do Estado da Bahia), in Paulo Afonso and Alagoinhas collections. Some of the mentioned species were not collected due to lack reproductive structures; thus, they were identified based on the taxonomic track technique (MARTINS; SCHIAVETTI; SOUTO, 2011).

2.5 Data analysis

The information was systematized in a MICROSOFT EXCEL® 2010 spreadsheet and subjected to quantitative and qualitative analyses. A list of plant species showing the strongest community preferences was based on a ranking that followed the order these species were cited by each participant in the free list. The ANTHROPAC 4.98 software was used to set the salience index (S.I.) for all plants (BORGATTI, 1996), since it allows inferring the most culturally important species (QUINLAN, 2005; GOMES; BANDEIRA, 2012).

3 Results and discussions

3.1 Participants' profile

Thirty-one (31) participants, 32% men and 68% women, belonging to the age groups 20-30 (29%), 31-40 (16%), 41-50 (16%), and older than 50 years (39%) were interviewed. Forty-eight percent (48%) of them were farmers, 13% were housewives, 9.7% were community leaders, 6.4% were retirees, 6.4% were tribal chiefs, and 3.3% (each) were health workers, lunch ladies, midwives, teachers and prayers.

The sex that most participated in the current study corroborated the study by Coan and Matias (2013), in which women represented 71% of the surveyed individuals. According to Torres-Avilez et al. (2014), sex differences are often linked to profession or to social role, fact that explains the predominance of women in the current research, since they spend more time at home performing household activities and are more easily accessible.

3.2 Ethnobotanical survey

Twenty-one (21) species, in total, distributed in 20 genera and 14 families, were cataloged for intestinal parasitosis treatment purposes (Table 1). The number of cited plants is significant in comparison to the studies by López-Sáez and Pérez-Soto (2010) and Muthee et al. (2011), who investigated the traditional knowledge associated with

botanical species presenting antiparasitic action and identified 13 and 7 plants, respectively. Their results were similar to those recorded by Molgaard et al. (2001), who listed 21 plants indicated to treat schistosomiasis.

Plants indicated by Kantaruré-Batida interviewees constitute essential data to help understanding the pharmacopoeia used by indigenous people living in the Brazilian Northeastern region to treat intestinal parasitosis, if one takes into consideration that researches conducted in the region present only one to three species used for such purpose (COUTINHO; TRAVASSOS; AMARAL, 2002; MORAIS et al., 2005; CUNHA LIMA et al., 2012; VASCONCELOS; CUNHA, 2013), except for the study by Santos-Lima et al. (2016), who recorded 12 plant species used by the Kantaruré-Baixa das Pedras indigenous community.

Euphorbiaceae was the family presenting the largest number of species (4 spp.), and it was followed by Leguminosae (3 spp.), Anacardiaceae (2 spp.). The other families were represented by a single species. Other ethnobotanical surveys carried out in the Brazilian semiarid region also showed higher indication of plants belonging to the first two families (ALBUQUERQUE; OLIVEIRA, 2007; ROQUE; ROCHA; LOIOLA, 2010; PAULINO et al., 2011; RODRIGUES; ANDRADE, 2014). The indication of such families was possibly associated with the significant plant diversity recorded in the caatinga area (MORO et al., 2014), which favors their use, besides highlighting their therapeutic significance, since they are recurrently used by distinct groups (RIBEIRO et al., 2014).

With respect to the origin of the plants, 62% were native and 38% were exotic; this result is not often found in the literature on the Brazilian Northeastern region (ALBUQUERQUE et al., 2009; CARTAXO; SOUZA; ALBUQUERQUE, 2010; ALMEIDA et al., 2012). However, data analyzed by Albuquerque (2006) corroborate the current study by showing higher use of native plants (52%) than of exotic ones (48%).

The number of native species used to treat worm infections in the current study differed from results found by Oliveira and Albuquerque (2005), who recorded a large number of allochthonous plants used for this purpose. The high use of native plants by Kantaruré-Batida indigenous people can be explained by the availability of these resources in their village. According to the utilitarian redundancy hypothesis (ALBUQUERQUE; OLIVEIRA, 2007), the large number of native species used to treat a single disease can help reducing the use pressure and help conserving the local flora.

The most used parts were peels (33%), roots (19%), leaves (14%), fruits (14%), flowers, seeds and latex (9%, each), which corroborated the study by Coutinho, Travassos and Amaral (2002), although it differed from the study by Vasconcelos and Cunha (2013), who recorded higher use of leaves. The higher use of peels in semi-arid regions can be explained by the availability of these structures throughout the year, unlike the other structures, which are affected by long drought periods (GAZZANELO; LUCENA; ALBUQUERQUE, 2005). Seasonal differences also justified the indication of parts presenting medicinal potential such as cotton (*Gossypium hirsutum* L.) root, flower and seed, because when one part of it is lacking, it is possible using the other, as shown in the analyses conducted by Almeida, Franchin and Marçal Júnior (2006).

Table 1 – Antiparasitic plants used by the Kantaruré-Batida indigenous community, Glória County, Bahia State, Brazil. I.N.: Indigenous name; O: Origin; P.U.: Part used; F.C.: Frequency of citation; S.I.: Saliency index; V: Voucher; E: Exotic; N: Native; R: Root; P: Peel; Le: Leaf; Fl: Flower; Fr: Fruit; S: Seed; L: Latex; HAL: Herbarium of Alagoinhas; HPA: Herbarium of Paulo Afonso; N.C.: Not collected; *: Species identified by taxonomic track.

Family/ Scientific name	I.N.	O	P.U.	Preparation method	Use form	F.C	S.I.	V
Amaranthaceae								
<i>Beta vulgaris</i> L.*	beterraba	E	R	No preparation	Eating it in the morning	3%	0.026	N.C.
Anacardiaceae								
<i>Anacardium occidentale</i> L.	cajueiro	N	P	Cooking or soaking it	Gargling or drinking it	3%	0.021	HAL-14373
<i>Myracrodruon urundeuva</i> Allemão	aroeira	N	P	Soaking it along with ameixa	Drinking it	10%	0.081	N.C.
Caricaceae								
<i>Carica papaya</i> L.	mamão	E	Fr	Baking the fruit	Eating it before seeing the eye of the sun or for 3 days during the new moon phase	13%	0.175	HAL-14385
Convolvulaceae								
<i>Operculina macrocarpa</i> (L.) Urb.*	batata de purga	N	R	Grating, drying and turning it into flour	Eating it along with mamão seeds	3%	0.053	N.C.
Euphorbiaceae								
<i>Croton argyrophyllus</i> Kunth	caçatinga	N	P	Grating and soaking it with water	Drinking it	10%	0.135	HAL-14379
<i>Croton heliotropifolius</i> Kunth	Pitô	N	P	Grating and soaking it with water	Drinking it	10%	0.085	HPA-28050
<i>Jatropha mollissima</i> (Pohl) Baill.	pinhão brabo	N	L	Removing the 'eye'	Applying drops onto the worm	3%	0.053	HAL-14377
<i>Ricinus communis</i> L.	mamona	E	Fr	Removing the pulp and stepping on it	Eating it	3%	0.041	HAL-14382
Leguminosae								
<i>Hymenaea courbaril</i> L.	jatobá manso	N	P	Soaking it	Drinking it	3%	0.006	HPA-28194
<i>Phaseolus vulgaris</i> L.*	feijão de arranca	E	S	Soaking it and stepping on it early in the next morning	Drinking the milk (1/4 of a glass) after fasting, for two days in a row	6%	0.084	N.C.
<i>Poincianella microphylla</i> (Mart. ex G.Don) L.P.Queiroz	catingueira prepem	N	Fl	Making syrup by blending herbs	Drinking it every day until feeling better	23%	0.368	HAL-14376
Lamiaceae								
<i>Ocimum campechianum</i> Mill.*	manjeriçao	N	Le	Making tea or stepping on it	Drinking it or applying it on the sore spot	3%	0.042	N.C.
Malvaceae								
<i>Gossypium hirsutum</i> L.	algodão	E	R; Fl; S	Soaking it; Cooking it; Making tea	Drinking it at night or early in the morning after fasting	3%	0.053	HAL-14372
Musaceae								
<i>Musa paradisiaca</i> L.	banana	E	Fr	Kneading it along with a garlic clove	Eating it before going to bed	3%	0.035	HAL-14383
Myrtaceae								
<i>Eucalyptus globulus</i> Labill.*	eucalipto	E	Le	Making tea	Drinking it	3%	0.035	N.C.
Oleaceae								
<i>Ximenia americana</i> L.	ameixa do mato	N	P	Soaking it along with aroeira	Drinking it	3%	0.012	HPA-28714
Sapindaceae								
<i>Cardiospermum halicacabum</i> L.	chucainho	N	R	Making tea	Drinking it	3%	0.047	HAL-14384
Sapotaceae								
<i>Sideroxylon obtusifolium</i> (Roem. & Schult.) T.D.Penn.	quixabeira	N	P	Soaking and filtering it	Drinking it	3%	0.026	HPA-28051
Verbenaceae								
<i>Lippia thymoides</i> Mart. & Schauer	alecrim	N	Le	Macerating it with urucubee honey and filtering it	Bathing with it or chewing it	6%	0.079	HAL-14374
Xanthorrhoeaceae								
<i>Aloe vera</i> (L.) Bern.f.	babosa	E	L	Applying three drops to the water	Drinking it	6%	0.070	HPA-28053

Source: Prepared by the authors

Different preparation methods were herein mentioned; the most often referred ones were soaking (43%) and tea making (19%). The most often cited application form was intake (95%), and it was followed by local application (10%), and gargling and bathing (5%, each). Variations in plant handling and administration by indigenous people were also recorded by Sivasankari, Anandharaj and Gunasekaran (2014), and by Ahmed and Akhtar (2016). It was noticed that plants such as *Ximenia americana* L. (ameixa do tomo), *Myracrodruon urundeuwa* Allemão (aroeira), *Musa paradisiaca* L. (banana), *Operculina macrocarpa* (L.) Urb. (batata de purga), *Poincianella microphylla* (Mart. Ex G.Don) L.P. Queiroz (catingueira prepem) and *Carica papaya* L. (mamão) were possibly used in combination with other plants to enhance their therapeutic effects. Frausin et al. (2015) also recorded the use of mixtures among indigenous people living in the Brazilian Amazon, where *Euterpe precatoria* Mart. and *Persea americana* Mill. are prepared along with other herbs to treat malaria.

The knowledge comparison between participants showed quantitative variation: 13% of them cited more than two species, 52% mentioned up to two species, and 35% did not know the flora used to treat intestinal parasitosis. There was also typological variation: *P. microphylla* (catingueira prepem) was the plant recording the highest consensus, since it was indicated by 23% of the respondents; it was followed by *C. papaya* (mamão - 13%); by *M. urundeuwa* (aroeira), *Croton argyrophyllus* Kunth (caçatinga) and *Croton heliotropii-folius* Kunth (pitó), which recorded 10%, each; and by *Lippia thymoides* Mart. & Schauer (alecrim), *Aloe vera* (L.) Berm.f. (babosa), *Phaseolus vulgaris* L. (feijão de arranca), which recorded 6%; each. All the other species were indicated by only 3% of the respondents. Similar idiosyncratic distribution was also found among the Fulni-ô people and it can be justified by knowledge restriction to a single specialist or family nucleus or by the fact that some members of the tribe had contact with other groups, from which the knowledge was acquired, although not spread (ALBUQUERQUE et al., 2011b).

Age variations also influenced the knowledge. The elderly (> 50 years old) showed greater knowledge than younger age groups (between 20 and 50 years old); this result was similar to those recorded in other studies (FRANCO; BARROS, 2006; CHEIKHYOU-SSEF et al., 2011). However, respondents belonging to the age groups 20-to-30 years and older than 50 years were among participants who had no knowledge about the use of antiparasitic flora. Almeida et al. (2012) recorded decreased number of plants cited among elderlies, possibly due to memory loss. Thus, the same hypothesis can be applied in the current research, since elderlies who did not mention medicinal plants were between 60 and 90 years old.

Plants indicated for antiparasitic use, which presented high salience index (S.I.) were *P. microphylla* (catingueira prepem - 0.368), *C. papaya* (mamão - 0.175), *C. argyrophyllus* (caçatinga - 0.135), *C. heliotropiifolius* (pitó - 0.085), *P. vulgaris* (feijão de arranca - 0.084), *L. thymoides* (alecrim - 0.079) and *A. vera* (babosa - 0.070). Plants presenting higher salience are possibly associated with greater efficacy, since the options made in indigenous medical systems are not just linked to the traditional knowledge acquisition, but also to cause and effect analyses (HAVERROTH, 2013), which determine the degree of reliability on distinct species.

The antiparasitic potential of *C. papaya*, the species presenting the second highest S.I., was also indicated by Tapeba (MORAIS et al., 2005) and Pataxó (CUNHA LIMA et al., 2012) indigenous people. The Pataxó group also indicated *A. vera*, the species presenting the seventh highest S.I., as antiparasitic medication. Such use consensus reinforced the medicinal value of the aforementioned plants in the traditional treatment of intestinal parasitosis.

In addition to the aforementioned species, indigenous people living in the Brazilian Northeastern region also indicated the following plants as antiparasitic agents: *Persea americana* Mill. (abacateiro), *Cucurbita pepo* L. (abóbora), *Lithraea brasiliensis* L. (aroeira), *Senna spectabilis* var. *excelsa* (Schrad.) H.S.Irwin & Barneby (fedegoso), *Mentha x villosa* Huds. (hortelã), *Chenopodium ambrosioides* L. (mastruz), *Citrullus vulgaris* Schrad. (melancia) and *Guatteria villosissima* A.St. Hil (pindaíba) (COUTINHO; TRAVASSOS; AMARAL, 2002; MORAIS et al., 2005; CUNHA LIMA et al., 2012; VASCONCELOS; CUNHA, 2013, LEITE; MARINHO, 2014).

Among the traditional names used by the Kantaruré-Batida people, *Cardiospermum halicacabum* L. (chucainho) and *C. heliotropifolius* (pitó) were two new records in the literature. *Cardiospermum halicacabum* L. is also known by other Portuguese names such as cipó-de-vaqueiro (SILVA; ANDRADE, 2005), para tudo (ALBUQUERQUE et al., 2007), poca and coração da índia (NETO; MORAIS, 2003); whereas *C. heliotropifolius* is also known as quebra facão (FERREIRA; PRATA; MELLO, 2013) milame (GOMES; BANDEIRA, 2012) and velame (SARAIVA et al., 2015).

3.3 Ethno-medical-botanical knowledge acquisition, spread and use

Most participants (91%) reported having acquired their knowledge about the medicinal potential of plants through hereditary transmission, whereas a smaller portion of them reported that their knowledge resulted from the contact with tribal chiefs (6%) or from their own experiences (3%). In addition, 77% of the participants stated that they pass on their knowledge through conversations with family members, whereas 23% said that they do not spread their knowledge due to ineffective medicinal plants, lack of interest from other family members, mainly the younger ones, or because they think that everyone already knows about healing herbs.

These data corroborate information that point towards oral transmission as one of the main knowledge-spreading means (SRITHI et al., 2009; SOLDATI; ALBUQUERQUE, 2012), besides confirming that even traditional peoples have members who do not believe in curing diseases through the flora, as recorded by Santos, Araújo and Batista (2010), who found that 13% of the respondents did not believe in the efficiency of phytotherapeutic drugs. However, 100% of the respondents in the study by Giraldo and Hanazaki (2010) reported relying on the local botanical medicine and stated that plants have beneficial effects on health.

The use of medicinal plants as the first resource to treat diseases was mentioned by 65% of the participants; it was higher than the use of manufactured drugs, which was mentioned by 35% of the respondents. Similar result was recorded by Leite and Marinho

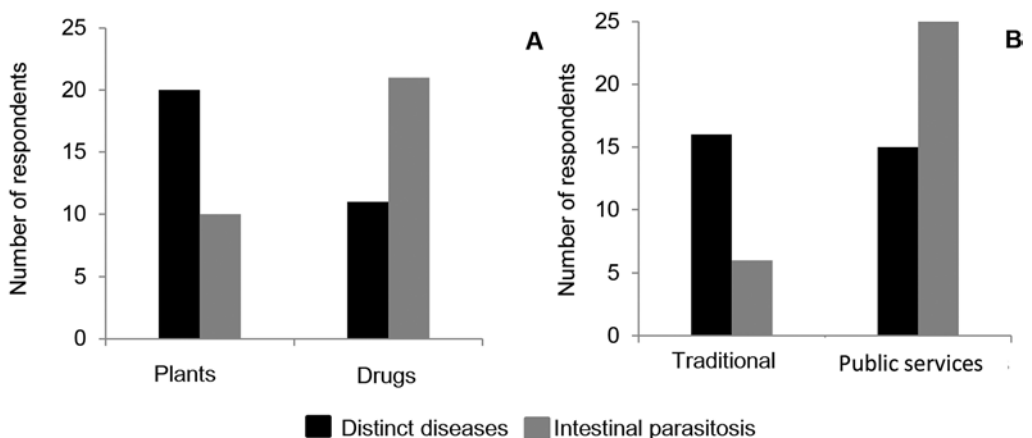
(2014) among Potiguara indigenous people; most of them (51%) reported using plants as the first treatment strategy, whereas 31% reported seeking medical care. Fifty percent (50%) of the participants seek traditional reference people (community specialists) or use home-made medications to treat diseases, whereas others make the option for public services (medical facilities, hospitals or health agents). This cross-reference between traditional information and information acquired through globalization processes has been called knowledge hybridization - a process in which new healing methods are incorporated in the local medical system in order to help people coping with changing circumstances (REYES-GARCÍA et al., 2014).

The resources and the reference people sought to treat intestinal parasitosis significantly changed in comparison to other pathologies (Figure 2); the use of drugs (68%) and public services (81%) was higher than the use of plants (32%), as well as than the search for traditional therapies (19%). It showed that knowledge hybridization negatively affects the local knowledge transmission process.

Vandebroek et al. (2004), Alves and Povh (2013), and Reyes-García et al. (2013) have recorded interferences capable of reducing the transmission and exercise of traditional practices. These interferences are linked to the proximity to urban centers, to the easy access to public health services and to the pursuit of economic activities outside the tribes. Another possible explanation presented by Ferreira Júnior, Silva and Albuquerque (2014) is that communities living in urbanized areas have less access to forests, fact that makes the use of biomedicine more convenient. However, the last reason (less access to forests) does not apply to the participants of the current research, since the species cited by them are easily found near their residences or in the forest. Thus, the greater use of drugs can be better explained by the easy access to urban centers or because the indigenous village has a medical facility and can count on medical services on a weekly basis.

Figure 2 – Variation in the use of resources (A) and reference people (B) by Kantaruré-Batida individuals to treat different diseases, Glória County, Bahia State, Brazil.

The reduced transfer of ethno-medico-botanical knowledge resulting from the



Source: Prepared by the authors

inclusion of health services was corroborated by the community itself when they were asked about the frequency they used plants for medicinal purposes (Table 2). Although the most often answer concerned the persistent use of medicinal plants (58%), data showed the preference for using industrialized drugs to treat parasitosis, fact that may gradually lead to the devaluation or, in the long term, to the erosion of the local medical-parasitological knowledge.

Table 2 – Medicinal plant-use status among Kantaruré-Batida indigenous people, Glória County, Bahia State, Brazil.

Source: Prepared by the authors

Change category	Justification	Frequency of citation
Increased	<p><i>“Because as days go by we get to know the medicinal use of new plants”</i></p> <p><i>“Because it is better than the one from the drugstore”</i></p>	10%
Did not change	<p><i>“We use it”</i></p> <p><i>“Because it is the first option”</i></p> <p><i>“Because it even uses the roots”</i></p> <p><i>“Because the elders are wiser”</i></p> <p><i>“Because it is necessary”</i></p> <p><i>“They do not use it too much, but use it”</i></p>	58%
Decreased	<p><i>“Because the medical staff come every week”</i></p> <p><i>“Because they think it is better this way”</i></p> <p><i>“They just want to go to the hospital”</i></p> <p><i>“After the medical facility was implemented”</i></p> <p><i>“The emergence of pharmacological drugs”</i></p> <p><i>“Because they do not like it”</i></p> <p><i>“Because they do not believe it works”</i></p> <p><i>“They prefer pharmacological drugs because they are sweet”</i></p> <p><i>“Because no one wants to go to the woods to search for plants”</i></p> <p><i>“Because it is not working”</i></p>	32%

4 Final considerations

The current study showed that the Kantaruré-Batida community has relevant information about plants used to treat intestinal parasitosis. Their therapeutic itinerary comprises different use methods, as well as different plant combinations, and it helps better understanding the indigenous healing system adopted in the Brazilian Northeastern region. Most plants used by the community are native; among them one finds *P. microphylla*, which recorded the highest cultural salience index. We believe that the diversity of plants mentioned to be used for the same purpose may help reducing the use pressure

and reinforce the conservation of native flora. However, it is necessary conducting further studies to evaluate these relations in the Kantaruré territory.

Despite the considerable number of antiparasitic ethnospecies listed in the current study, most participants prefer using pharmacological drugs. Such preference may be linked to interferences deriving from their proximity to public health services and urban centers; this hypothesis is reinforced by the participants' narrative. Therefore, this intermediality process suggests the need of taking actions based on the National Indigenous Peoples' Health Care Policy (BRASIL, 2002), which addresses the importance of having health-related activities articulating with indigenous practices in order to value the use of medicinal plants.

Finally, it is necessary carrying out interdisciplinary studies and projects focused on the dialogue between public sectors and health/social sciences in order to help strengthening and spreading the medical-parasitological knowledge of Kantaruré-Batida indigenous people, as well as to help conserving the medicinal flora and reducing factors capable of generating cultural erosion, as a way to preserve the medical identity of the herein studied community.

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Original Article

ANTIPARASITIC PLANTS USED BY THE KANTARURÉ-BATIDA INDIGENOUS COMMUNITY (NE-BRAZIL): ETHNOBOTANY AND LOCAL KNOWLEDGE-EROSION RISKS

Abstract: Indigenous people have an intrinsic relationship with the flora used in healing systems. However, data about plants used to treat intestinal parasitosis, which are one of the main morbidity and mortality causes among indigenous peoples, remain scarce. Thus, the aim of the current study is to survey antiparasitic plants used by the Kantaruré-Batida community and to investigate whether their ethno-medico-botanical knowledge is spread. Therefore, it adopted interviews and free lists. Thirty-one (31) indigenous individuals were interviewed and they mentioned 21 plant species. Most respondents (91%) acquired the traditional knowledge through hereditary transmission and spread it (77%) in the same way. Only 35% of the respondents adopt medicinal plants as the first cure resource, besides associating the decrease of such use to their proximity to health care services. Thus, it is worth taking actions to help preserving the local knowledge and biodiversity in order to avoid the loss of indigenous therapeutic treatments.

Keywords: Caatinga; Traditional knowledge; Indigenous people; Intestinal parasitosis; Medicinal plants.

Resumo: Indígenas possuem uma relação intrínseca com a flora empregada em sistemas de cura. Entretanto, poucos são os dados acerca das plantas usadas no tratamento de parasitoses intestinais, uma das principais causas de morbimortalidade entre índios. Desse modo, este estudo realizou o levantamento das plantas antiparasitárias utilizadas pelos Kantaruré-Batida e avaliou se ocorre difusão do conhecimento etnomedicobotânico. Para tanto, utilizou-se entrevistas e listas livres. Foram entrevistados 31 indígenas, os quais citaram 21 espécies. A maioria dos informantes (91%) adquiriu o conhecimento tradicional por transmissão hereditária e o difundiu (77%) da mesma forma. Apenas 35% utilizam as plantas medicinais como primeiro recurso de cura e associam a diminuição do uso a proximidade dos serviços de saúde. Portanto, tornam-se relevantes ações de preservação dos saberes e da biodiversidade local visando a manutenção da terapêutica indígena.

Palavras-chave: Caatinga; Conhecimento tradicional; Índios; Parasitoses Intestinais; Plantas medicinais.

Resumen: Indígenas tienen una relación intrínseca con la flora empleada en sistemas de curación. Sin embargo, pocos son los datos sobre las plantas usadas para el tratamiento de parásitos intestinales, una de las principales causas de morbimortalidad entre indios. De este modo, este estudio realizó el levantamiento de las plantas antiparasitarias utilizadas por los Kantaruré-Batida y evaluó si hay difusión del conocimiento etno-médico-botánico. Para eso, se utilizaron entrevistas y listados libres. Fueron entrevistados 31 indígenas e citadas 21 especies. La mayoría de los encuestados (91%) adquirió el conocimiento tradicional por transmisión hereditaria y lo difunde (77%) de la misma forma. Sólo 35% utiliza las plantas medicinales como primer recurso de curación y asocian la disminución del uso debido a la influencia y la proximidad de los servicios de salud pública. Por lo tanto, son necesarias acciones para preservar los saberes y la biodiversidad local para el mantenimiento de la terapéutica indígena.

Palabras clave: Caatinga; Conocimiento tradicional; Indios; Parásitos intestinales; Plantas medicinales.
