

Local Knowledge and Botanical Teaching At Campo De Caroebe/ Roraima School

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ABSTRACT

Plants are natural resources essential for human survival, with which local populations establish important cultural relationships to meet their basic needs. Such relationships involve local knowledge that is little considered in the pedagogical practices of school education. As a result of this reality, this research focuses on the contribution of the approach of local knowledge of medicinal plants in the teaching of Botany content in a rural school, located in the municipality of Caroebe in Roraima, in 2017. To access the knowledge, we use questionnaires with students from a class of the 2nd year of high school and also, diversified didactic activities were carried out in the approach to the content. We proved that the development of the didactic sequence with local knowledge favored the understanding of the contents of Botany and contributed to the involvement of students in the proposed pedagogical activities.

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Introduction

Biology teaching in its various areas, almost always, takes place in the traditional model. This model prioritizes the expository class as a strategy, in which the contents are presented to the student, and the student has the task of memorizing them, disregarding historical and cultural elements in the education of the student [1]. Thus, cultural knowledge and local reality have been neglected in the school teaching process. This distance from reality limits the development of the student's ability to think and act critically and consciously [2].

Therefore, the adoption of pedagogical practices that value traditional knowledge, also called local, are defined by Albuquerque and Alves as: "the experiences and knowledge accumulated by a human group in relation to natural resources", in the classroom [3]. Classroom has been presented as an alternative to assist in the learning process, in an education aimed at training citizens with critical capacity to interpret the world [4-6]. This type of approach stimulates the reorganization of the nervous system, generating behavioral changes that make science teaching more pleasurable and exciting and, at the same time, promotes significant didactic contextualization [4,6].

In the Rural Education proposal, respect for culture and local realities are considered fundamental to guarantee a differentiated education, demanded by social movements. In this sense, the rural context is privileged to teach Botany content, as the interaction

of students with plant diversity and other natural resources in daily agricultural practices favors the accumulation of knowledge that represents the peasants' own cultural identity [7]. When approaching this subject, Paiva states that: "ethno-knowledge is rooted in the learning experienced by the approximation with natural assets" [6].

Among natural assets, plant species represent an important cultural heritage, essential for the survival of traditional populations. These social groups look to nature for elements for cultural maintenance and, in this way, meet their basic needs, for example, food and traditional medicine. Therefore, the society-nature relationship cannot be dissociated from peasant school education, especially in the teaching of Biology and other related scientific areas. However, the teaching of Botany in basic education is configured as theoretical and uninteresting, requiring changes in pedagogical practices that promote meaningful learning [8]. In this discussion, several difficulties are found in teaching practice, such as: absence of laboratories, lack of continuing teacher training, high workload and also, disarticulation of Sciences with the reality experienced by students and the lack of textbooks with examples of flora and regional fauna [9].

As a field subject, the first author, studying and then developing academic activities (workshop and internship) in the field school, had the opportunity to experience the context of the classroom, where, most of the time, teachers teach content without relate them to the prior knowledge of students, or even other members of the community. Teachers commonly resort to exposition of textbook contents, and to the assessment of learning, which is generally

carried out by means of fixation exercises or tests applied for the purpose of assigning grades.

Therefore, we saw an opportunity to build school knowledge with differentiated pedagogical actions in the approach to botanical contents, as a contribution to peasant education. This type of intervention included local knowledge about medicinal plants easily found in the backyards of homes, and in other community spaces, thus it is believed that we can make classes more dynamic, creating a favorable condition for the apprehension of the contents taught. In this pedagogical process, the students of the "Jatapulândia" school, the name given to the school by the first residents of the locality, bring with them the advantage of interacting in their daily lives with elements of nature, including medicinal plants, so they accumulate important knowledge they need be explored in detail in the classroom, as the teacher enables didactic situations that involve this local knowledge, at the same time, teaching didactic contents. With this type of approach, students are led to the exercise of thinking about their own realities

Initiatives towards the inclusion of local knowledge about medicinal plants in teaching practices have been developed by researchers in other Brazilian states [4,10-12]. This type of intervention in the classroom is supported by the perspective of multiculturalism and by epistemological pluralism, which defend the valorization of the beliefs of local populations in the learning of didactic contents, as a way of establishing a dialogue with scientific knowledge.

Despite the existence of a diversity of local knowledge, studies with the objective of valuing the peasant reality in the Jatapulândia school are still unknown. Thus, this research is a pioneer in this rural school. Therefore, we propose to carry out this study, carried out in 2017, during the internship period in Biology, for which we formulated the following questions: can local knowledge about medicinal plants contribute to the learning of Botany contents offered at the field school? Does the use of differentiated strategies that include the knowledge of students and residents favor the learning of Botany content?. With the purpose of seeking answers to these questions, we outline as a general objective: to analyze the contribution of traditional knowledge about medicinal plants in the learning of Botany contents, taught in the 2nd year of high school at the Clóvis Nova da Costa State School, in the municipality of Caroebe.

Use of Medicinal Plants and Teaching Botany

Medicinal plants, as a therapeutic action, have been used for many centuries, and they are used for the treatment, cure and prevention of diseases in different cultures. The introduction of synthetic therapy is an important factor in changing this use [13,14]. However, in the peasant context, traditional medicine is maintained for several reasons, such as spirituality and beliefs in ancestors, practices that most support the medicinal use of plants. Despite the evolution in the production of industrialized medicines and the local populations already having contact with health centers and hospitals, they too, resort to plants on several occasions [5,6]. Therefore, this knowledge has social and economic importance, allowing the identification of new species, they innovate the pharmaceutical industry [15].

It is worth remembering that the globalization process contributes to the de-characterization and disappearance of traditional knowledge, making it essential to preserve the knowledge of popular culture. This can be done in the school environment by

encouraging the learning of Botany content, and can be addressed within an environmental education project [16].

However, the teaching of Botany has not appropriated the students' prior knowledge. Often, this is based on the explanation of content to draw the student's attention, without promoting reflection on issues related to their daily lives. Although the biological importance of vegetables in teaching is recognized, this arouses little interest from students in botanical content, which is usually presented in an elaborate way full of terminology difficult to be assimilated [16].

Therefore, there is no concern about getting to know Botany in a significant way, with didactic actions that favor, for example, the recognition of the plants surrounding the school, neighborhood or municipality; or even, relating the plants of the environment under a holistic view, their economic and ecological importance, which seems to constitute a difficult goal to achieve [9]. In this sense, the reflection of Camargos and Alves, that learning does not happen in the same way, depends as much on the subject who learns as on the object of apprehension [1].

Thus, the teaching-learning process needs to consider the student's potential to learn and the possibilities of building knowledge within a global vision that forms citizens according to the ethical-ecological axis, capable of assigning meaning to the contents worked in the classroom. The promotion of improvements in the quality of education will lead the student to take a critical position in relation to issues related to biological diversity and the valuation of natural assets [8].

Based on these considerations, we defend the idea that the school should be a space that enables dialogue between teachers and students about the knowledge that is part of our culture and that scientific curricula do not make up the classes of science an authoritarian discipline, holder of the truth [5]. Paiva says that science is also culture, it is a way of demarcating knowledge, that through dialogue it is possible to determine the differences and similarities between scientific and traditional knowledge and build a new way of teaching Biology, forming a new culture to be understood by students [6].

Methodology

This research is characterized as mixed methods research, in which "both quantitative and qualitative data are obtained at the same time and the implementation is simultaneous", considering it as an exploratory study, with quantitative and qualitative [17]. It was taken into account that social relations can be analyzed in their "ecological" and concrete aspects and deepened in their most essential meanings [18]. Quantitative research works at the level of reality, where data are presented to the senses and qualitative research works with beliefs, representations, habits, attitudes and opinions.

The research was carried out at the Clóvis Nova da Costa State School, located on BR 210, km 118, in the municipality of Caroebe, Southern Region of the State of Roraima (Figure 1). This school is known as Jatapulândia, in allusion to the Jatapú River, which passes near Vila de Entre Rios. It offers elementary education II and high school. During the period when the study was carried out, it served approximately 200 students distributed in the morning and afternoon shifts, all of them from the neighboring and BR of Vila de Entre Rios de Caroebe.

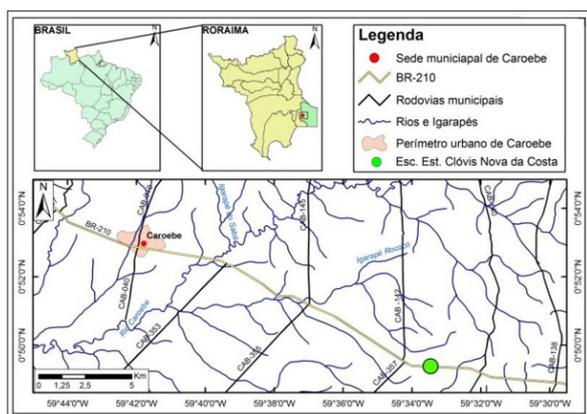


Figure 1: Map of the state of Roraima with the location of Escola do Campo

In this study, students of both sexes and different ages participated, totaling 26 students from a second-year high school class, enrolled in 2017. They answered questionnaires about their previous knowledge about medicinal plants before and after the intervention and during the At the end of the activities, evaluations of the contents and of the didactic activities were carried out.

In another stage of the research, we promoted didactic situations, such as practical classes, group and individual dynamics and production of drawings, using diverse resources, which were selected to teach contents of the didactic sequence (plant morphology and plant pollination).

Still, we will use the technique of direct observation, based on the experience of the researcher and the teacher from the field school, seeking information that would allow us to assess the participation of students and learning about the contents. To analyze the research data, we chose to organize these in spreadsheets in the Excel Program, and later, analyzes based on Descriptive Statistics, and the organization of tables to present the results.

The results of the subject addressed in the didactic sequence were systematized in order to expose the students' knowledge about the contents, especially Angiosperms, making the relationship between scientific and local knowledge, taking care not to devalue their knowledge [19].

Ethical and Legal Aspects of Research

The research proposal was presented to the school board and the head professor of the Biology subject, and official authorization was requested for its implementation. Subsequently, it was submitted to the Ethics Committee of the University of the Federal University of Roraima, having been approved through Opinion No. 2.442.552 of December 15, 2017 and following the recommendations contained in Resolution No. 510/16, of the National Council of Health. Before conducting the interviews and applying the questionnaires, the Informed Consent Form and the Informed Consent Form were presented, which were signed by the participants and guardians, respectively.

Results and discussion

Traditional knowledge of field school students about medicinal plants

All students participating in the research live in the countryside and come from neighboring towns of Entre Rios in the municipality of Caroebe. The majority (69%) of them were male, aged between 16 and 20 years, with only 3 of them married with children. They are migrants from the states of Amazonas, Maranhão, Acre, Rondônia, Pará and Roraima.

As shown in table 1, the pre-questionnaire data indicated that all participating students consulted make use of medicinal plants, however, in some quotes, some were unable to justify the reason for their use. In total, there were 100 citations of 30 medicinal plants and the most cited indications for use were: as a tranquilizer and for the treatment of flu. However, although they live close to the forest, it was found that large tree species were not mentioned in the questionnaire, only those cultivated in the backyard or purchased from neighbors. Probably, this is because they do not understand that medicinal plant is any species used for therapeutic purposes.

Table 1

Name of popular plants/ scientific	used part	Indication of use	form of preparation	Number of citations
	sheet	The flu	Decoction	1
	sheet	Colic and Infections	Decoction	2
Cotton/Gossypium				
Mulberry/Morus nigra	sheet	Menopause	Maceration	4
Arnica/ Solidago chilensis	Flowers	The flu	Poultice	1
Banana tree/Muse sp	whole plant	Anti-inflammatory	Natural	9
Potato/Solanum tuberosum	Source	Gastritis	Poultice	4
Hummingbird/Trochilidae	sheet	The flu	-	1
Beetroot/Beta vulgaris esculenta	sheet	Anemia	crushing	1
Bilberry/Plecthanthus	sheet	Problems in liver or stomach	Decoction	13
Cashew/Anacardium	between shell	High pressure	Maceration	1

western				
Chamomile / Feverfew	sheet	Soothing	Decoction	1
recites				
Cinnamon/Cinnamomum	bark	Soothing	Decoction	3
verum				
Capim Santo/Cymbopogon	sheet	Soothing	Decoction	7
citrates				
Onion/Alluim strain	sheet	The flu	Poultice	1
Lemon balm / Lippia alba	sheet	Soothing	Decoction	12
Fennel/Pimpinella	sheet	Soothing	Infusion	2
anisum				
Ginger/Zingiber	Source	Lose weight,	Decoction	1
office		hoarseness		
Guava/Psidium guajava	sheet	Diarrhea	Decoction	4
Mint/Mentha sp	sheet	The flu	Infusion	8
Orange / Citrus	sheet	Flu and Soothing	Decoction	2
Marijuana/Cannabis sativa	sheet	stomach pain	Maceration	2
		head		
Realm Malva/Mauve	sheet	The flu	Syrup	2
wild				
Hose/Hose	bark	Infections	Maceration	1
indicates				
Basil/Ocimum	whole plant	The flu	Syrup	1
basilicum				
Mastrich/Chenopoduim	sheet	Vermifuge, anti-	Poultice	5
ambrosioids		inflammatory		
Mucuiba/Virola sebifera	Peel and milk	Anti-inflammatory	Maceration	1
Santa Barbara/Cinamomo	sheet	Anti-inflammatory	Poultice	1
Tipi/ Arrabidaea chica	Source	Anti-inflammatory	Decoction	3
Urucum/Bixa orellana L.	Seed	Anemia	poultice and	1
			maceration	
Vick/Mentha arvensis	sheet	The flu	Decoction	5

The leaf was the part of the plant most cited by students, it is more easily collected and can be found throughout the year [19]. The most common form of preparation was decoction, this type of preparation is indicated for plants that do not lose their effectiveness when they come into contact at high temperatures [20].

Medicinal plants are those “used to improve health, both orally and subcutaneously”. This is the understanding of a transferred student from the Federal Institute of Roraima-IFRR, where she had the opportunity to participate in activities that involved local and traditional knowledge. There were those who said that “I know little, only what I saw my parents doing”, this statement reinforces what Kovalski says, popular knowledge is typical of peasants, passed from generation to generation, acquired through imitation and/or experience folks [5]. One student stated that he believed in the healing power of medicinal plants: “because medicinal plants are better for healing than medicines, they serve for pain or even wounds inside or outside the body.”

Several answers given by students show us the healing value they attribute to medicinal plants: “medicinal plants are very important for health; they help us to get better from illnesses”; “They help

many people to treat illnesses, who make medicines with them”; “that it serves as a treatment”. We found that all students use medicinal plants, that some know more, others less, but all bring with them knowledge about plants. For Baptista, it is necessary to pay attention from teachers to the prior knowledge of students, seeking to direct their teaching practice in search of facilitating communication, exploring converging and diverging points with scientific content, without overvaluing scientific knowledge to the detriment of traditional ones in the science teaching [10].

Regarding the origin of traditional knowledge about medicinal plants, students unanimously attributed it to family members (grandparents and parents), and 25% of them said that their knowledge was also acquired at school, however this school knowledge attributed by the students refers to attend a workshop held at the school in the year prior to the survey.

According to 75% of the informants, medicinal plants are sought in their own crops and 50% said they get them from neighbors. These responses are typical situations of peasants, who plant their own food and when they do not have it, they get it from their neighbors, as cooperativism is present in the local context.

All students believe that their knowledge in the classroom about medicinal plants can contribute to their school education, according to Paiva, it is necessary to seek teaching that encourages students' critical thinking and argumentation skills, only in this way will we form citizens participating in society, this critical development can and should be addressed at school [6]. For this to happen it is necessary to abandon traditional education where classes are based on the transfer of concepts and decorative listings, with the teacher being the central subject responsible for the transfer of their knowledge in lectures [21].

Most students stated that knowledge about local medicinal plants can be addressed in Biology classes, 83.3% of them believe that from plants known by students, the teacher could address Botany contents (plant morphology, biodiversity, taxonomy) and suggested the cultivation of medicinal plants in the garden as a practical activity at school or working with specimens of medicinal plants. However, almost all students were categorical in saying that their knowledge was not valued in the classroom and the subject of medicinal plants was never addressed. With a position contrary to that, only one student recently transferred to the locality, who said that she participated in classes where her traditional knowledge was valued.

Didactic strategies for teaching Botany content

The classes were held during the period of supervised internship in Biology in 2017, of the second class of the Licentiate Course in Rural Education, with an emphasis on Natural Sciences

and Mathematics. The internship comprised two stages, called observation phases (14 hours) and conducting (20 hours). In the first phase, a didactic sequence was presented to the students, containing the contents of plant morphology (root, stem, leaf and flower) and pollination.

Several aspects were considered before the beginning of the conducting phase, for example, the fact that the content "Reino Plantae" had already been taught by the full professor of the discipline. The routine problems that occur with school transport and delay the start of classes, such as: lack of fuel, mechanical problems, the non-trafficability of the roads, and finally, due to the need for content evaluation by the head teacher of the subject, it was agreed that the activities proposed to compose the course grade would be considered in the evaluation, after which the lesson plan was presented to the full professor, in which the teaching methodologies and teaching resources used in the intervention in the Biology course were detailed.

We selected some species of medicinal plants mentioned by the students. These were presented in the classroom, in total four specimens of each plant organ (root, stem, leaf, flower and fruit), with the intention of working on different types of plant structures, relating scientific and local knowledge during the theoretical classes. Information from the textbook was presented on slides and in practical classes, when we used plant organs. It is noteworthy that these plants were chosen based on the students' quotes (Table 2).

Table 2: Plants selected as teaching resources in Botany classes

Part studied	Source	Stalk	sheet	flower	Fruit
	Garlic	passion fruit	stinky	annatto	Blackberry
Plant	basil	potato	Jambu	guava tree	cashew
used	Sweet potato	Onion	Ginger	pitangueira	Orange
	masthead	Vick	Holy grass	passion fruit	Avocado

The medicinal plants selected as a didactic resource helped in the understanding of the contents related in the didactic sequence. These plants were collected with the help of the community, healers and the students themselves, and the main parts of the vegetables were presented in the practical class, when we also cite as examples tree species found in the school yard - mango and cashew trees -. Also, group dynamics and individual activities were proposed, in which students studied the parts of the plant: root, stem, leaf, flower and fruit. During these activities, they were able to express their knowledge about medicinal plants, including through drawings in which morphological structures of plant parts were identified.

To teach about pollination, the video "The beauty of pollination in high definition and slow motion" was used as a didactic resource. With a duration of 00h04m23s, which shows several species of insects, such as bees, bats, hummingbirds, beetle and flies carrying out the pollination process, contact with pollen and dispersion, all in high definition and slow motion, it also presents the growth and maturation of some fruits from pollination. The use of this video favored the discussion about the importance of pollinators and the pollination process. Despite the short time, we observed the students' enthusiasm, as they had not had classes that used video as a teaching resource.

We positively evaluated the use of group dynamics, as they contributed to greater interaction of students, who exposed their

knowledge in a relaxed way: I like lemon balm tea, capim santo, anise, boldo, cinnamon, vick, among others, we also highlighted the answers: "Blackberry is good for the liver, The guava flower is good for a stomachache, when I get hurt I use menstruz, annatto is good for anemia".

All proposed activities were focused on favoring the teacher-student approach as recommended by Fagundes and Gonzales, seeking to encourage the participation of students through the discussion of examples of plant species of knowledge of students, found in the context of the community, but also relating local and scientific knowledge systems [22]. Therefore, this information supported the teaching of the contents proposed in the didactic sequence, promoting the contextualization of the contents. It was noticeable that the contact with medicinal plants in the classroom accentuated interest and encouraged class participation in the proposed activities. Thus, the understanding of issues was facilitated, for example, about function and the different types of roots, which we verified in the speeches of students in the classroom.

Ah teacher! Why didn't he say it right away, in the forest there is a lot, the Jatobá is like that. The 3Estoeira, a teacher who is like that, serves medicine because when we buy that spiced brandy, it has her name on it (the student meant that it contains in the ingredients on the label of the homemade medicine sold locally).

When answering about examples of strangling roots, Vixe teacher, we see a lot when it comes to breaking nuts. Can she kill the tree? Because once I saw a dry tree all wrapped around one of these. I thought it was a “stick” I didn’t know it was a root. We already knew all kinds of roots that you mentioned, I just didn’t know they had those names.

These students’ speeches prove that they carry popular knowledge with them that can be discussed by the biology teacher. It was observed that, at first, when asked if they knew plants with tabular roots in the local context, all students answered no, but after viewing the images of tabular roots presented on slides, the answers were immediate, identifying species that occur in the woods.

Regarding the indication for the use of medicinal plants with fascicular roots, one student said: “corn has this type of root, my mother said it is used for measles, she makes tea from the corn hair and drinks it, so the measles comes out. She said that’s what her mother gave her.” The student’s statement goes against one of the rules proposed by Cobern apud Baptista for teaching Biology topics.

Give students time to explore their own ideas. Science teachers need to recognize the existence of diversity of thought and ask students if they would like opportunities to explore issues of interest to them. For this, it is necessary to create an environment conducive to the speeches, however, paying attention to the time (so as to contemplate all students) and to the exposition only of arguments that are culturally based.

At the end of each class, we carry out an assessment to verify learning, and whenever we start the next class, the subject of the previous class was resumed with the discussion of assessments. For example, in the results, we found that 60% of the students correctly answered that the sweet potato is a tuberous root and 40% were wrong when saying that it is a tuberous stalk. The students had difficulty in distinguishing which type of plant structure they were asked about, the banana stalk was identified by 70% of the students as an example of a rhizome and 30% as a pseudostem, showing that the student’s knowledge can broaden the discussion about plant structures and learning about meanings.

When discussing information from the local context, in an assessment in which a healer, whose fictitious name described in the activity was João, had damaged a part of the plant’s root and for this reason, it would no longer serve as a seedling, they were asked which part the plan would be this, all students answered correctly, root, one student’s speech stands out; “Pillifer, if you damage this part, you can lose the entire plant,” he added. when you see that it has already taken root, you have to remove the plant with the fertilizer and the soil together”. The student used the scientific knowledge acquired in the classroom in his speech, associating it with that acquired from his daily experience.

Also, with the intention of dynamically evaluating the learning of the contents, we asked students to draw medicinal plants, highlighting their main parts - stem root and leaves -, and later comment on the design both the botanical and medicinal aspects, and as a result, we obtained drawings of several medicinal plants such as: vick, lemon balm, grass, mastruz and cotton and we highlighted excerpts from the students’ speeches: “Banan tree, its stem is in the ground and is a rhizome for burning.”, “The heart it is good for the flu, it has asexual reproduction”. “Cotton plant is used for infection in women and has a pivoting root.”

The final stage of the intervention consisted of analyzing students’ learning based on responses to a questionnaire, of which only 13 students responded, due to suspension of classes for almost two weeks, due to lack of fuel for school transport.

In general, students approved the activities carried out in the classroom. 77% of them said that this type of approach helped their learning and 23% that it did not contribute to understanding the subject. Although this disapproval, the teaching activities received 100% approval, being considered important to learn the contents covered because they allowed an association between theoretical and practical knowledge (62%) and interaction between students and participation in classes (77%). positive assessment can be seen in excerpts from the students’ speeches.

It was a great job, because I was able to learn more about biology with plants.” “I liked the activities with the plant show and the dynamics.” “The class was great, but it would improve if it were also practiced more often, such as when the teacher showed the plants through the window.

All participants considered the approach to medicinal plants in the discipline of Biology important, as, according to them, it facilitates the understanding of the subject. The percentage of students who did not have classes that addressed their knowledge was significant. Only 8% have had their knowledge valued in the classroom, recommending that activities be extended to other classes. “There was a lot and little time, the teacher had to make more presentations with slides and the failure of some students is probably related to lack of motivation with teaching at the rural school: “I have nothing to say, it won’t make a difference. “it may have the best class in the world, but it won’t work” going against the grain of what Pessin and Nascimento say in relation to the teaching of Botany, which needs to arouse the interest and motivation of students, which can be achieved in practical classes [23].

We found that there was learning of the contents taught, reflected in the correct answers to the questions in the assessments, which presented a minimal margin of error, in comparison with the assessments that students usually do in the classroom. Students were able to understand the didactic content when it was associated with traditional knowledge. This associative methodology is defended by Kovalski; Obara who believes that through the dialogue between the two forms of knowledge, Local and scientific, it is possible to investigate and value the students’ prior knowledge, with the intention of building more elaborate knowledge, scientific knowledge [5]. In this sense, Paiva recalls that “in the field of scientific education, it is important to highlight that legitimate knowledge is not only generated by the methods of science, which traditional communities, for example–interpret [6].

Final considerations

The flora of medicinal species identified by the students has a predominance of herbaceous plants, these plants are cultivated in the backyards of their homes, they are used to treat different ailments. More than half of the citations refer to indications for the treatment of diseases that affect children. We verified that it is a question of vertical transmission of knowledge, that is, these are passed on from parents to children of generation and generation, both through observation and also through teachings.

The pedagogical intervention with differentiated didactic activities in the rural school sought approximations between local and scientific school knowledge, starting from the knowledge of

community members and the students' previous conceptions about medicinal plants. The results showed that contact with medicinal plants in the classroom motivated the participation of students in the proposed activities, awakening interest in the topic.

We proved that the development of the didactic sequence with traditional knowledge favored the understanding of the didactic contents and contributed to the involvement of students in the pedagogical activities proposed to teach Botany based on elements of the reality of the community.

In view of the positive results obtained in this study, we recommend the development of other researches contemplating the knowledge of the local community, as a way of valuing knowledge and conserving natural resources, to be discussed in the classroom of the rural school.

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