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## **MEDICINAL ETHNOBOTANY AS A STRATEGY FOR TEACHING BIODIVERSITY IN THE PUERTA ROJA SINCELEJO-SUCRE NEIGHBORHOOD**

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**Abstract:** The concept of biodiversity is the derivation of ecological processes, such as competition, natural selection and speciation, therefore within education they are recognized as fundamental within the teaching of biology, constituting an interdisciplinary element, which is why, in this work, is integrated into ethnobotany with the purpose of being applied as a strategy for teaching biodiversity, becoming an effective tool in the recognition of botanical concepts and popular knowledge in this community. The study was carried out in the Puerta Roja neighborhood, semi-structured interviews were applied to 30 students from the community, transmitting their knowledge about medicinal plant species. Through a mixed approach, it was possible to register 16 medicinal plants, included in 14 families where the family stands out: *Lamiaceae Rutaceae y Fabaceae* showing a high diversity in terms of the vegetation present in this rural area.

**Keywords:** Ethnobotany, teaching, biodiversity, Puerta Roja.

## INTRODUCTION

For Andrade (2020), the purpose of teaching biology is to train students from a critical perspective linked to their environment, which will help them acquire key values concerning environmental issues. That said, teachers when planning and executing their classes must consider a set of factors that allow them to achieve the established achievements in this area.

In this order of ideas, the teacher must strive to modify the traditional way of transferring knowledge; That is, implement tools and techniques, where the student actively participates, making them protagonists of the entire process. (Benavides & Tovar 2017).

As a result, emphasis is placed on ethnobotany, which according to Remeteria (2007) is that discipline in charge of studying

the management that people give to plant species, and in turn, examines the interaction and importance they exhibit, covering a diversity of botanical teachings, articulating traditional knowledge about medicinal plants with the contents of science such as biology that allow a positive impact on the knowledge of biodiversity. With ethnobotany, different skills are strengthened, including knowledge and interaction with the environment, which refers to exploration, since, through field trips, one interacts with the environment, promoting knowledge of biodiversity. According to the author Díaz (2002), the school as an organism can be reflected as a space to rescue various knowledge of biodiversity through ethnobotany, understanding it as an educational strategy with great potential to redirect teaching towards biological knowledge thanks to that favors the development of thinking, the acquisition of skills and attitudes, both critical and reflective, in the face of present environmental challenges.

## METHODOLOGY

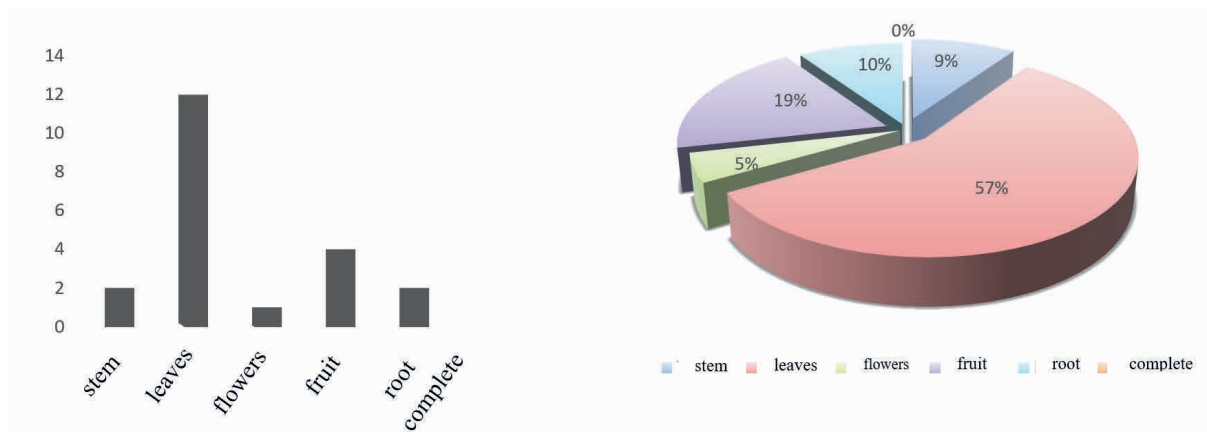
Considering that the purpose and conduct of this research directly involves contact with a specific community, some of the most used social research strategies were taken into account.

## AREA OF STUDY

The study area is located towards the northeast of the urban area of this municipality, which corresponds to the Puerta Roja neighborhood located to the N (10° 21' 03.58"), (81° 30' 28.04"). To carry out the work, the methodology established by Andrade (2020) was adapted. To collect information, semi-structured interviews were applied to a sample of 30 students between 17 and 25 years old from the Puerta Roja community (Sincelajo-Sucre). Implementing

PLANTS USED	PART OF THE PLANT USED						PREPARATION MODE	ROUTE OF ADMINISTRATION	NUMBER OF CITATIONS
	T	H	F L	F R	R	Complete			
Vernacular name									
Orégano		x					Soared or cooking	Orally	2
Eucalipto		x					Cooking	Orally	4
Matarratón		x					Poultice	Orally	1
Azar de la India		x					Cooking	Orally and baths	1
Níspero	x	x		x			Cooking	Orally	2
Jengibre					x		Cooking	Orally	2
Último real		x					Cooking	Orally	1
Sábila		x					Glass shake		2
Cilantro	x	x					Cooking	Topical Route	2
Burundanga				x			Infusión	Respiratory route	1
Toronjil		x					Cooking	Orally	1
Naranja agria.				x			Cooking	Orally and baths	2
Guanábana		x		x			Cooking	Orally	1
Cola de caballo					x		Cooking	Orally	1
Totumo		x					Cooking	Orally	1
Flor de Jamaica		x	x				Cooking	Orally and baths	1

Tabea 1: Ethnobotanical Sheet.



Graphic 1. Most used vegetative part of plants.

Graphic 2. Percentage of use of the most used part

information recording techniques such as ethnobotanical sheets, field diaries and active observation.

## RESULTS

In this work it was possible to glimpse that the population surveyed recognizes that, thanks to the plant resources provided by nature, they obtain a better quality of life, therefore the value of establishing mechanisms for their conservation through scientific knowledge, management and actions in to replicate this knowledge. Table 1 shows the information collected through these techniques, finding around 16 plant species, distributed in 16 vernacular names; that through the use of botanical knowledge using taxonomic keys recognizing plant characters (see table 2), it could be grouped into 14 families, among which Lamiaceae, Rutaceae and Fabaceae stand out.

On the other hand, it can be clearly seen that the leaves are the most used vegetative part with a value of 57%. Followed by the fruits with a usage rate of 1

Below, the taxonomic classification of the plant species found is presented, as well as their most important botanical characters, which was intended to further deepen the knowledge of this discipline so essential in the study of natural sciences.

## ANALYSIS OF THE RESULTS

Medicinal plant species reflect a strong association with ethnobotany, because they are planted in the community, taking advantage of their palliative benefits, that is, there is a connection between the inhabitants and the vegetation in their environment, results that agree with those obtained by Andrade 2020.

This coincides with what was reported in other works such as that carried out by Angulo et al., 2012, which highlights the value of traditional knowledge about the use of

medicinal plants to treat different conditions of the human body systems.




On the other hand, in this research work it was found that the majority of medicinal plants are trees and shrubs, and to a lesser extent herbaceous species, which differs from what was reported by De la Torre et al., 2006. Where it establishes that herbs are generally used in palliative treatments.

It must be noted that it was also possible to adhere to the plant systematics, implementing botanical knowledge in the characters of the plant, allowing us to know according to its description the names of each medicinal plant and in the same way to know which parts of the plant contain the greatest phytotherapeutic activity using these botanical concepts.




The classification of medicinal species guarantees that taxonomically it is the same plant species, leaving aside confusion due to the great variety of vernacular names by which they are known.





In addition, it also reflects an articulation with the teaching of natural sciences, because it is an existing knowledge in this neighborhood of Puerta Roja that is implicitly related to the themes of science, which are transmitted from generation to generation by other family members in the homes and that In a certain way they can be expressed in the educational institution when the teacher links them to their curricular contents.





In view of this, it is important that the teacher can include traditional epistemology about medicinal plants in the classroom to address botanical topics, so that this is meaningful to students and thus build learning about biodiversity, achieving positive results in the preservation of the environment. With the strategy of identification of vegetative characters, a strengthening of learning about biodiversity in this community was perceived.

Vulgar/ Scientific Name	Botanical Description	Medicine use	Picture
<b>Orégano</b> <i>Origanum vulgare</i>	Light green fleshy leaves, opposite, petiolate, simple, to ovate with acute to straight base, acute to obtuse apex and toothed edges. (Rouquaud & Videla, 2000)	Fight earaches and cough.	 <a href="https://www.pinterest.com/pin/424886546077003459/">https://www.pinterest.com/pin/424886546077003459/</a>
<b>Eucalipto</b> <i>Eucalyptus camaldulensis</i>	Evergreen tree. Its young leaves are opposite, oval and sessile, adults are alternate, leathery, with an asymmetrical petiolate and hanging leaf blade.	Treat respiratory conditions, combat feverish symptoms	 <a href="http://3.bp.blogspot.com/-3b4Huk-3WjA/UY7w_GrKU4I/AAAAAAAAAOs/oOiZ9-3VW5Q/s1600/Eucalipto+3.png">http://3.bp.blogspot.com/-3b4Huk-3WjA/UY7w_GrKU4I/AAAAAAAAAOs/oOiZ9-3VW5Q/s1600/Eucalipto+3.png</a>
<b>Matarratón</b> <i>Gliricidiosepium</i>	Tree, deciduous shrub. Its leaves are compound, odd-pinnate and alternate. The flowers are pink and grouped in clusters.	Used as baths for skin diseases, also as a diuretic and against fever.	 <a href="https://uploads.vibra.co/1/2021/07/para-que-sirve-el-matarraton-1.png">https://uploads.vibra.co/1/2021/07/para-que-sirve-el-matarraton-1.png</a>



<p><b>Azar de la India</b> <i>Murraya paniculata</i></p>	<p>Green shrub with smooth bark. Leaves alternate, oval, pinnate, with 3 to 9 alternate leaflets, and its base is cuneate, entire margin, shiny green surface and light underside. The flowers are white.</p>	<p>Used to treat toothache. In baths it is used for fever.</p>	 <p><a href="https://horomidis.gr/wp-content/uploads/2020/11/Murraya-Paniculata-Mock-Orange-2.jpg">https://horomidis.gr/wp-content/uploads/2020/11/Murraya-Paniculata-Mock-Orange-2.jpg</a></p>
<p><b>Nispero</b> <i>Manilkara huberi</i></p>	<p>Tree, with large, entire, elliptical, alternate leaves, yellow on the underside. The flowers in fascicles, white, 3-sepals. Ovoid fruit in yellow drupe.</p>	<p>Used to treat kidney stones, its cooked leaves are used to reduce triglycerides.</p>	 <p><a href="https://mundoplantas.com/wp-content/uploads/2020/05/img-arbol-nispero-con-fruta.jpg">https://mundoplantas.com/wp-content/uploads/2020/05/img-arbol-nispero-con-fruta.jpg</a></p>
<p><b>Jengibre</b> <i>Zingiber officinale</i></p>	<p>Herb with underground stems, aromatic with a spicy flavor and whitish color inside. It has false aerial stems, alternate leaves. Tight and basal inflorescences.</p>	<p>Used to combat respiratory symptoms, lose weight, cleanse the blood.</p>	 <p><a href="https://jardineriaplantasyflores.com/wp-content/uploads/2015/09/Planta-de-jengibre.jpg">https://jardineriaplantasyflores.com/wp-content/uploads/2015/09/Planta-de-jengibre.jpg</a></p>

<p><b>Último real</b> <i>Euphorbia tithymaloideses</i></p>	<p>Shrub, deciduous. It has grayish-green, succulent stems. Subsessile leaves, with a petiole 1 to 2 mm long, are lanceolate or oblanceolate.</p>	<p>It is used as a diuretic and reduces cholesterol levels.</p>	 <p><a href="https://identify.plantnet.org/es/the-plant-list/observations/1010363883">https://identify.plantnet.org/es/the-plant-list/observations/1010363883</a></p>
<p><b>Sábila</b> <i>Aloe barbadensis</i></p>	<p>Perennial herbaceous plant, reduced stem and fasciculated roots. The leaves are thick and fleshy, green, lanceolate, sessile and sheathed at the base, entire and with thorny teeth at the edges.</p>	<p>Colon treatment, lower cholesterol levels.</p>	 <p><a href="http://m.innatia.info/images/galeria/aloe-vera-4.jpg">http://m.innatia.info/images/galeria/aloe-vera-4.jpg</a></p>
<p><b>Burundanga</b> <i>Hyoscyamus niger</i></p>	<p>Robust, tall, hairy and perennial herb. Its basal leaves are petiolate, with their leaf blade ovate and lobed.</p>	<p>In the community it is used as an anti-inflammatory for bruises and muscle sprains.</p>	 <p><a href="https://estaticos-cdn.prensaiberica.es/clip/51866b26-6965-46b2-93c9-b10dab1d62cb_16-9-aspect-ratio_default_0.jpg">https://estaticos-cdn.prensaiberica.es/clip/51866b26-6965-46b2-93c9-b10dab1d62cb_16-9-aspect-ratio_default_0.jpg</a></p>
<p><b>Toronjil</b> <i>Melissa officinalis</i></p>	<p>Herbaceous plant with adventitious roots. Opposite petiolate leaves, with toothed edges, light green in color and pubescent on the underside. The leaves give off a pleasant lemon-like smell.</p>	<p>It is used to treat flu symptoms, cough and reduce fever.</p>	 <p><a href="https://pymstatic.com/49448/conversions/toronjil-small-21_9.jpg">https://pymstatic.com/49448/conversions/toronjil-small-21_9.jpg</a></p>

<p><b>Naranja</b> <b>agria</b> <i>Citrus aurantium</i>L.</p>	<p>Perennial tree with simple, alternate, elliptical or lanceolate leaves, very aromatic, entire margin. White flowers, with 5 petals. Its round fruits, with a thick and rough orange peel.</p>	<p>It is used to treat high fever and intestinal parasites</p>	 <p><a href="https://www.biodiversidadvirtual.org/herbarium/index.php?sessionId=98pcfgkqjk4vtead591ck3p5c1">https://www.biodiversidadvirtual.org/herbarium/index.php?sessionId=98pcfgkqjk4vtead591ck3p5c1</a></p>
<p><b>Guanábanaa</b> <b>Annona muricata</b></p>	<p>Tree or shrub, elliptical or obovate oblong leaves. Flowers solitary on the stem, with three sepals and six ovate petals, Green, fleshy ovoid fruit, with thorn-shaped tubers.</p>	<p>It is commonly used to treat stomach pains and in baths to treat flu-like symptoms.</p>	 <p><a href="https://plantidtools.fieldmuseum.org/es/nlp/catalogue/3686478">https://plantidtools.fieldmuseum.org/es/nlp/catalogue/3686478</a></p>
<p><b>Cola decaballo</b> <i>Equisetum arvense</i> L.</p>	<p>Herbaceous plant with stems in two forms, some fertile and others sterile, branched into whorled branches.</p>	<p>This plant is used for deworming purposes in children.</p>	 <p><a href="https://plantasflores.com/equisetum-arvense/">https://plantasflores.com/equisetum-arvense/</a></p>
<p><b>Totumo</b> <i>Crescentiacujete</i> L</p>	<p>Tree with opposite leaves with entire edges, spatula-shaped, leathery and smooth. Its flowers are solitary, yellowish with purple veins.</p>	<p>It is used to treat cough and ear pain.</p>	 <p><a href="https://identify.plantnet.org/es/martinique/observations/1015561465">https://identify.plantnet.org/es/martinique/observations/1015561465</a></p>



<p><b>Flor de Jamaica</b> <i>Hibiscus sabdariffa</i></p>	<p>It is an herb with robust greenish or reddish stems. The leaves are alternate, oval, they can be simple or three-lobed. Solitary flowers, with 5 petals. The capsular fruit with an accrecent and fleshy calyx.</p>	<p>It is used to treat cholesterol levels and increase the body's defenses.</p>	 <p><a href="http://consultafrutas.blogspot.com/2016/12/jamaica-hibiscus-sabdariffa.html">http://consultafrutas.blogspot.com/2016/12/jamaica-hibiscus-sabdariffa.html</a></p>
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**Table 2:** Botanical characters of the plants found.

## CONCLUSIONS

Ethnobotany as a learning strategy yielded positive results, realizing that from a scientific and empirical perspective it tends towards the link between people and the vegetation in their environment to remedy various pathologies that may arise.

On the other hand, with research carried out about ethnobotanical knowledge about medicinal plants, it is concluded that there is cultural knowledge in the Puerta Roja neighborhood, the inhabitants still carry

out these actions, being an exercise that has become extinct in many rural areas.

The contribution that medicinal ethnobotany as a teaching strategy offers within the botanical knowledge of a medicinal species, essential morphobotanical elements of each species that lead to studies and inventories of floral biodiversity; to implement necessary actions for its conservation; since many of these plants used have reduced their population after this therapeutic use.

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