

## Medicinal Plants in the Kankuama Indigenous Community: Traditional Knowledge and Sustainability

### Plantas medicinales en la comunidad indígena Kankuama: conocimiento tradicional y sostenibilidad

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#### Abstract

The Kankuama indigenous community has developed extensive knowledge about medicinal plants, essential to their traditional health system and identity. The research focused on identifying and documenting the variety of medicinal plants used by the Kankuamos, their applications and related traditional knowledge. The factors that threatened the conservation of this cultural and botanical heritage were explored, seeking to contribute to the preservation of their medicinal practices.

The methodology used was interpretive and qualitative, using the ethnographic method. The results revealed that the Kankuamos use more than 50 species of medicinal plants to treat various conditions, highlighting the transmission of their ancestral knowledge. The diversity of medicinal plants not only reflected the biological richness of the region, but also the link of the Kankuamos with their environment. The protection of this knowledge became vital. The conclusions point out the importance of integrating biodiversity conservation with the strengthening of indigenous knowledge to ensure the sustainability of their medicinal practices and cultural heritage.

#### Resumen

La comunidad indígena Kankuama ha desarrollado un extenso conocimiento sobre plantas medicinales, esenciales para su sistema de salud tradicional y su identidad. La investigación se centró en identificar y documentar la variedad de plantas medicinales utilizadas por los kankuamos, sus aplicaciones y el saber tradicional relacionado. Se exploraron los factores que amenazaban la conservación de este patrimonio cultural y botánico, buscando contribuir a la preservación de sus prácticas medicinales.

La metodología empleada fue interpretativa y cualitativa, utilizando el método etnográfico. Los resultados revelaron que los kankuamos utilizan más de 50 especies de plantas medicinales para tratar diversas afecciones, destacando la transmisión de su conocimiento ancestral. La diversidad de plantas medicinales no solo reflejó la riqueza biológica de la región, sino también el vínculo de los kankuamos con su entorno. La protección de este conocimiento se volvió vital. Las conclusiones señalan la importancia de integrar la conservación de la biodiversidad con el fortalecimiento del conocimiento indígena para asegurar la sostenibilidad de sus prácticas medicinales y su patrimonio cultural.

## 1. Introduction

Traditional medicine goes beyond being a simple set of practices; it represents a valuable cultural heritage that has been transmitted throughout generations. Indigenous communities have used native plants since time immemorial as tools for healing, understanding the environment and establishing a meaningful link with nature. This relationship is not limited to a spiritual aspect; it is also based on extensive and deep knowledge about the healing properties of various plants. Over the years, these communities have developed ancestral knowledge that combines observation, experimentation and collective wisdom, allowing them to recognize the medicinal benefits of the plant species that surround them. Thus, traditional medicine stands as an integral system that encompasses not only physical health, but also emotional and spiritual well-being, reflecting a worldview in which the human being is an inseparable part of nature.

The Kankuama indigenous community, located in the Sierra Nevada de Santa Marta region in Colombia, is an example of the country's cultural and biological diversity. This ethnic group has developed a vast knowledge of medicinal plants, which are an integral part of their traditional health system and cultural identity. This research seeks to identify and document the diversity of medicinal plants used by the Kankuama community, as well as their applications and associated traditional knowledge. In addition, the factors that threaten the conservation of this botanical and cultural heritage will be addressed, with the aim of contributing to the preservation of their medicinal practices and promoting the sustainability of their use over time.

This indigenous community faces the threat of the loss of its medicinal plant diversity due to urbanization, climate change and especially the lack of inter-generational transmission of knowledge. This puts at risk not only their health and well-being, but also their cultural identity and traditional practices.

This research article aims to identify the diversity of medicinal plants in the Kankuama indigenous community, taking into account their uses, traditional knowledge and the factors that threaten their

conservation, in order to contribute to recommendations for the preservation of their cultural heritage and the sustainability of their medicinal practices.

## 2. Theoretical reflections (search for authors)

### Origins of Indigenous Herbalism

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Indigenous herbalism has a rich history that dates back thousands of years, during which various indigenous cultures of the Americas have used medicinal plants as an essential element in their healing practices. These ancestral traditions have been transmitted from generation to generation, enriched by empirical knowledge and a deep spiritual connection with nature [1, 2].

Since pre-Columbian times, indigenous civilizations such as the Mayans, Aztecs and Incas, among others, developed a remarkable understanding of the healing properties of the plants that surrounded them. This knowledge was documented in codices, cave paintings and oral traditions that have survived to the present day, preserving the wisdom of healers and shamans [2].

Indigenous herbalism not only focuses on the treatment of physical illnesses, but also considers spiritual and emotional aspects of health. The inter-connection between body, mind and spirit is a fundamental pillar in indigenous herbal medicine, which seeks to restore balance and harmony with nature and the universe.

The history of herbal medicine in Colombia dates back to ancient indigenous civilizations, such as the Muisca and the Tayronas, who possessed a deep knowledge of the healing properties of local plants. These ancestral practices have been perpetuated through oral transmission between generations. Shamans and healers, respected figures in their communities, continue to play a fundamental role in preserving this knowledge [1, 2].

With the arrival of the Spanish in the 16th century, an enriching exchange of botanical knowledge took place, which broadened the herbalist panorama of

the country. Chroniclers and naturalists documented native plants, thus systematizing knowledge about their uses and properties. Recent studies highlight the relevance of these records to understand pre-Colombian herbal medicine and its evolution after European contact. [2, 3]

Today, academic research and community initiatives are crucial for the revalorization and protection of ethnobotanical heritage in Colombia. Universities and research centers are dedicated to scientifically validating the traditional uses of medicinal plants, promoting their sustainable integration into contemporary health practices. This renewed interest in traditional medicine responds to a global search for sustainable and effective health alternatives that respect both human well-being and the environment.

### **The Spiritual and Healing Value of Plants**

The spiritual and medicinal relevance of plants is fundamental in indigenous cultures, where their value transcends healing properties. For many indigenous peoples, plants are considered sacred beings that contain the wisdom of ancestors and nature spirits. Indigenous herbal medicine is not limited to the treatment of physical conditions; it also advocates the healing of the soul and connection with the divine. Each medicinal plant is seen as a gift from Mother Earth, functioning as a link between human beings, their ancestral roots and the cosmos. Healing rituals that employ these plants include not only the preparation and administration of remedies, but also the invocation of plant spirits and the performance of sacred ceremonies, with the aim of restoring balance and harmony. Thus, the use of medicinal plants encompasses a holistic approach to health that integrates the physical, spiritual, emotional and social [4].

### **The transmission of knowledge about medicinal plants**

The transmission of knowledge about medicinal plants in indigenous cultures of the Americas is carried out through deeply meaningful intergenerational learning. This practice is based on the transfer

of ancestral wisdom, which flows from grandparents to grandchildren, establishing a link that connects communities with their roots. Grandparents, in their role as guardians of traditional knowledge, share their experiences, stories and knowledge about the healing properties of plants with new generations. This process not only includes teaching about the plants themselves, but also highlights the importance of respecting and preserving nature, as well as the spiritual and cultural connection between indigenous peoples and their environment. Through this exchange of knowledge, generational ties are strengthened and the continuity of ancestral medicinal practices, essential for the health and well-being of communities, is ensured, integrating a holistic approach to health [5, 6].

### **Guardians of Ancestral Knowledge**

In indigenous communities, shamans and healers play an essential role as custodians of ancestral knowledge about medicinal plants. These spiritual leaders and healers possess a deep understanding of the healing properties of various plant species and the techniques necessary for their effective use in rituals and treatments. They are recognized for their ability to communicate with the spiritual world, which allows them to receive guidance on the proper application of medicinal plants to heal community members. [5,6] Through ceremonies and healing practices, they transmit their wisdom to new generations, ensuring the continuity of indigenous medicinal traditions. In addition, they act as intermediaries between the physical and spiritual world, facilitating the connection between individuals, plants and nature spirits, which is essential to maintaining balance in the community.

### **Kankuama medicinal plants.**

From a scientific perspective, medicinal plants are defined as those that contain a quantity and quality of active ingredients that have been shown to have therapeutic properties beneficial to human health [7]. These properties are based on the traditional use of various species and in different preparations, in order to prevent and treat various conditions.

Researchers such as Guzmán et al. (2017), from the National Institute of Forestry, Agricultural and Livestock Research of Mexico, state that “the use of medicinal plants through traditional medicine is ancestral.” In this context, different parts of the plant are used depending on the ailment or the specific recipe. Generally, leaves and flowers are used, although sometimes the stem or root are used. Medicinal plants can be consumed directly or prepared in infusions and homeopathic presentations, with each part of the plant being intended for specific uses according to the desired benefits [8].

Bruneton (1991) indicates that the use of these plants is intended to alleviate illnesses that affect people, offering accessible alternatives to the difficulty of acquiring patented medicines. Therefore, their main function is to act as medicines that attenuate the effects of various diseases that impact human health [7].

Additionally, the use of remedies made from plants is a common practice in the Kankuamo people, where traditional medicinal plants are grown in the courtyards of houses and in agricultural fields along the Sierra Nevada de Santa Marta. For this community, the use of medicinal plants is fundamental, since it provides benefits to the health of the Kankuamos and their neighbors. The relevance of these practices lies in the transmission of ancestral knowledge, which has been maintained throughout generations, constituting a cultural legacy. Among the most recognized medicinal plants in this community are cinchona and cat's claw, which are used in the preparation of medicines.

### 3. Methodology – Materials y Methods:

A research was carried out with the aim of identifying the diversity of medicinal plants in the Kankuama indigenous community, considering their uses, traditional knowledge and the factors that threaten their conservation. To do so, a qualitative approach was adopted within the interpretive paradigm, which allowed for a deeper understanding of the relationship between the community and its medicinal practices.

Ethnography was used as the main method, which facilitated immersion in the cultural context of the community. Through this methodology, the aim was to capture the richness of social interactions and the meanings that community members assigned to medicinal plants. Information was collected through non-participant observation, which allowed the researcher to naturally document the practices related to the use of plants, as well as the environment in which these activities were carried out.

Additionally, semi-structured interviews were carried out with community members, which made it possible to collect stories and knowledge about medicinal plants, their uses and associated traditions. These interviews were designed to foster an open dialogue, allowing participants to share their experiences and perspectives freely and in detail.

The analysis of the information collected focused on identifying recurring patterns and themes that emerged from the data, allowing for a deeper understanding of the diversity of medicinal plants and the traditional knowledge that underpins them. Factors affecting the conservation of this cultural heritage were also considered, including the influence of external factors and changes in the socioeconomic environment.

This comprehensive methodology seeks not only to identify the diversity of medicinal plants in the Kankuama Indigenous community, but also to contribute to the preservation of their cultural heritage and promote the sustainability of their medicinal practices in the face of contemporary threats. The results of this research are expected to benefit both the community and the academic field at large.

### 4. Resulted

Traditional knowledge and the sustainability of Kankuama medicinal plants constitute an invaluable cultural legacy and a comprehensive orientation towards health and well-being. The Kankuama community, part of the indigenous people of the Sierra Nevada de Santa Marta in Colombia, has cultivated over generations a deep understanding of the local flora and its healing properties. This ances-



tral knowledge is based not only on experience and observation, but is also closely related to their worldview and spiritual practices.

The sustainable use of medicinal plants is crucial to preserve both the biodiversity of the region and the knowledge that has been passed down from generation to generation. By implementing sustainable practices in the collection and use of these plants, the Kankuama community not only guarantees the availability of resources for future generations, but also fosters a harmonious relationship with nature. In a context where globalization and industrialization threaten numerous local traditions, the study and valorization of traditional Kankuama knowledge emerge as essential tools for cultural conservation and the promotion of sustainable health.

The results were achieved through the application of the ethnographic method, which was established as a fundamental methodological tool for the interpretation of the data. Through participant observation, semi-structured interviews and the analysis of documents and cultural elements, the perceptions and experiences of the Kankuama community were collected in relation to the various dynamics of traditional knowledge and the sustainability of medicinal plants in their context.

#### 4.1. Traditional knowledge

According to Carrillo (2019), the Kankuama people have accumulated, over the centuries, extensive knowledge derived from ancient wisdoms that have managed to endure despite years of intense violence. Today, in a process of recovery, their traditional medicine is no longer hidden. On the contrary, their healers, who are recognized as experienced botanists, are available to care for the sick before they reach a hospital [9].

In Atánquez, which is the capital of the Kankuama reservation located north of Valledupar, as well as in Guatapuri, Chemesquemena, Los Haticos and other nearby towns, valuable ancestral knowledge is preserved through the practice of botanical doctors and healers. Among them are figures such as Rafael Andrés Carrillo Montero, Faustina María

‘la Tina’ Cáceres Mendoza, Rafael Antonio ‘Makoko’ Rodríguez Arias, Adel Segundo Cáceres Urrutia, and Diógenes Segundo ‘Segundito’ Arias Montaño. These people are guardians of traditional knowledge that has endured over time, offering treatments and remedies based on popular wisdom and the rich biodiversity of the region.

In relation to the above, some interviewees say:

I learned to heal with healing plants from my mother, and I do it when someone asks me to help them with their health problem, I strive to offer them a solution. I have managed to heal people that doctors have not cured; the most common ailments are dizziness, kidney infections, and complications with menstruation (Arias, personal communication, January 19, 2019).

I have been healing with plants for more than 35 years. I learned to heal from my grandmother and an aunt. In the Haticos, people have been curing with plants and chirinche for centuries. The mamos cure all illnesses this way, from toothache to high fevers and more. In our community, we learn in every home what plants are for and we use them according to the illness. For example, aloe is used to reduce inflammation, marijuana leaves to soothe pain, chamomile for stomach pain, and so on (Arias-Villazon, personal communication, January 2, 2024).

The testimony shared by the interviewees reveals a deep knowledge and a rich tradition of alternative medicine based on the use of healing plants, passed down from generation to generation. This practice not only highlights people’s connection with their natural environment, but also the value of ancestral wisdom that has been preserved in their communities over time.

##### 4.1.1. Variety of healing plants

The Kankuama community is known for its rich cultural tradition and deep knowledge of the regional flora. Medicinal plants play a fundamental role in their daily life, not only as remedies for various ailments, but also as an integral part of their worldview and spiritual practices. The diversity of

plants they use reflects a close bond with nature and ancestral knowledge passed down from generation to generation. Through the collection and use of these plant species, the Kankuama not only seek to maintain their health, but also to preserve their cultural identity and strengthen their connection with the environment. In this context, the variety of medicinal plants becomes an invaluable treasure that deserves to be recognized and studied, both for its therapeutic value and for its cultural relevance.

Below, the reader is presented with a list of 37 healing plants used by the Kankuama community, including their traditional name, scientific name, and use in the community. This list was compiled from semi-structured interviews and the analysis of general documents (pages and non-formal brochures).

1. Achioté (*Bixa orellana*): Used for skin problems and as a natural dye.
2. Garlic (*Allium sativum*): Used for its antibacterial and antiviral properties.
3. Basil (*Ocimum basilicum*): Used for digestive problems and as an anti-inflammatory.
4. Arnica (*Arnica montana*): Used for bruises and muscle pain.
5. Anise (*Pimpinella anisum*): Used for digestive problems.
6. Anamú (*Petiveria alliacea*): Has anti-inflammatory, analgesic and antimicrobial properties. To treat respiratory conditions.
7. Cocoa (*Theobroma cacao*): Used in rituals and for its antioxidant properties.
8. Calendula (*Calendula officinalis*): Used to treat wounds and skin problems.
9. Chestnut (*Castanea sativa*): Used for respiratory problems.
10. Barley (*Hordeum vulgare*): Used for digestive problems and as a diuretic.
11. Onion (*Allium cepa*): Used to treat colds and respiratory problems.
12. Horsetail (*Equisetum bogotense*): Used as a diuretic and in the treatment of kidney problems.
13. Dandelion (*Taraxacum officinale*): Used as a diuretic and for liver problems.
14. Eucalyptus (*Eucalyptus spp.*): Used for respiratory problems and as an anti-inflammatory.
15. Guava (*Psidium guajava*): Used to treat gastrointestinal problems.
16. Peppermint (*Mentha spicata*): Used to relieve headaches and digestive problems.
17. Ginger (*Zingiber officinale*): Used for digestive problems and nausea.
18. Jasmine (*Jasminum spp.*): Used in rituals and for skin problems.
19. Chamomile (*Matricaria recutita*): Used to relieve digestive disorders and insomnia and anxiety.
20. Mint (*Mentha spp.*): Used to relieve stomach pains and digestive problems.
21. Moringa (*Moringa oleifera*): Used for its nutritional and medicinal properties.
22. Nance (*Byrsonima crassifolia*): Used for digestive problems.
23. Noni (*Morinda citrifolia*): Used for its anti-inflammatory and antioxidant properties.
24. Oregano (*Plectranthus amboinicus*): Used to treat respiratory and digestive problems, as well as to relieve sore throat.
25. Paico (*Dysphania ambrosioides*): Used to treat digestive problems, such as intestinal parasites.
26. Parsley (*Petroselinum crispum*): Used as a diuretic and for digestive problems.
27. Quina (*Cinchona spp.*): Used for digestive problems and as a tonic.
28. Rue (*Ruta graveolens*): Used as an abortifacient and to treat respiratory conditions.
29. Sage (*Salvia officinalis*): Used for digestive and respiratory problems.
30. Aloe vera: Used for wounds and skin problems.
31. Tamarind (*Tamarindus indica*): Used for digestive problems.
32. Thyme (*Thymus vulgaris*): Used for respiratory conditions.

33. Toronjil (*Melissa officinalis*): Used as a tranquilizer and for digestive problems.
34. Tutumo (*Crescentia cujete*): To treat digestive and respiratory problems.
35. Valerian (*Valeriana officinalis*): Used for anxiety and sleep problems.
36. Yanten (*Tropaeolum tuberosum*): This plant has anti-inflammatory properties to treat respiratory and digestive conditions.
37. Marijuana (*Cannabis sativa*): Used in the treatment of various conditions, such as chronic pain, anxiety, and nausea.

The research findings revealed that the Kankuama community employs an extensive and diverse repertoire of medicinal plants, with a significant number of species identified and catalogued. These plants are used to treat a variety of conditions, ranging from gastrointestinal and respiratory problems to dermatological disorders, among others. In addition, the deep traditional knowledge associated with the use of these species has been documented and passed down from generation to generation, thus underlining the relevance of ancestral wisdom in indigenous medicine.

#### 4.1.2. Most Commonly Used Plant Species

Characteristics, properties and medicinal uses in the Kankuama indigenous community of: Eucalyptus, Peppermint, Toronjil, Anamú, Calendula, Rue, Chamomile, Oregano, Ginger, Horsetail and Marijuana.

##### Eucalyptus (*Eucalyptus grandis*)

This plant is native to temperate regions extending from Europe to the Himalayas. Its height can vary between 10 and 90 centimeters. The leaves are simple, with lengths ranging from 2 to 6.5 centimeters and widths of 1 to 2 centimeters; in addition, they have a hairy texture and closed edges. The flowers can be purple, white or pink, and grow at altitudes ranging from sea level to 2,500 meters [10].

Among the medicinal plants most used by the Kankumos, is this species, which is used to relieve stomach pains. When combined with chamomile,

amaranth and lemon balm, it becomes an effective remedy to calm the nerves, regulate blood pressure and treat heart problems. In the morning, its infusion with chamomile helps eliminate gases, while when boiled with milk and paico it is used to combat parasites. In addition, it is cooked over low heat with basil, and its decoction can be ingested or applied in poultices on the head to improve intelligence. It is also used in sweet baths, especially for the well-being of infants.

##### Peppermint (*Mentha arvensis*)

Peppermint is a plant native to the Mediterranean, which can reach heights that vary between 60 centimeters and 2 meters. Its stems are cylindrical, robust and have a slight channeling. The leaves have an intense green color, are elongated and thin, with sharp tips that harden on the outside during the summer. The flowers of the mint plant are grouped in bunches that can contain from ten to forty small flowers of an attractive golden yellow color, each with five petals. The fruit, approximately 5 millimeters long, has a dark brown color. This plant develops in temperate and warm temperate climates, and its reproduction occurs through seeds [10].

As for its uses, mint infusion is used to help mothers who have difficulties with breastfeeding, often sweetened with panela. It is also mixed with fennel and lemon juice to apply it on the forehead or crown, in order to relieve headaches. In addition, this plant strengthens the immune system and contributes to fighting anemia, as it helps eliminate toxins from the body. It acts as an expectorant, relieving dry cough, and is also effective in reducing cholesterol levels and lowering fever. It also improves urinary infections and digestive disorders, relieving the accumulation of gases.

##### Melissa (*Melissa officinalis*)

Melissa is a plant that originates from the Mediterranean basin and Asia Minor. In Greek, it is called “melissa”. Today, this plant has been introduced into various temperate climate regions around the world, both as an ornamental plant and for medicinal purposes. [10]

It is said that the infusion of lemon balm is beneficial for relieving cold in the ovaries, contributes to

visual and bone health, and helps cleanse the uterus and other internal organs. In addition, it is attributed with antioxidant properties.

### **Anamú (*Petiveria alliacea*)**

It is a herbaceous plant with a vascular system and produces seeds. It belongs to the same family as anise, fennel, wild fennel and carrot. It is native to the Mediterranean, the Caucasus and the Himalayas. It can reach a height of 1 meter. It has elongated stems that form a thick stalk [10]

In the Kankuma community, this plant is used to relieve gas build-up, reduce abdominal fat, control high blood pressure, alleviate menstrual pain, and improve vocal disorders. In addition, it is credited with the ability to eliminate uric acid and it is claimed that its juice can increase sexual desire. When presented in dried and crushed form, it is effective in treating mouth sores and gum problems. Poultices made from it are beneficial for healing. Also, the infusion of its stem and leaves is used to regulate cholesterol levels. This herb is characterized by having a neutral flavor.

### **Calendula (*Calendula officinalis*)**

It belongs to the Verbenaceae family, which includes both quick-relief and verbenas. This plant is native to South America and was introduced to Europe for cultivation. It is a shrub that can reach up to 3 meters in height. Its leaves, which are grouped in one place, can measure up to 7 cm and are lanceolate in shape, with smooth or serrated edges. In addition, it has an intense aroma reminiscent of lemon, [10].

Kankuamo healers maintain that this plant is beneficial for improving the quality of sleep. It is used to release air accumulated in the body. In addition, it has antioxidant and digestive properties, which makes it an effective remedy for relieving stomach pain, nausea, diarrhea and flatulence. It is also able to reduce muscle discomfort caused by physical activity and mitigate allergy symptoms. This herb facilitates the expulsion of phlegm and contributes to the health of the respiratory system. It also fights the bacteria responsible for bad breath and is characterized by its sweet taste.

### **Rue (*Ruta graveolens*)**

Rue is a plant that is mainly used to add aroma to various dishes. Indigenous women who are pregnant incorporate it into their diet in order to address anemia problems. In addition, its infusion is used to promote fat burning and relieve stomach ailments. The extract of this plant is also used in the treatment of acne, [11].

This species belongs to the Labiatae family and is characterized by being a small shrub, which can reach approximately 60 cm in height. It has a robust stem and tiny, elongated leaves, which emanate a distinctive smell. Rue thrives in semi-tropical regions.

### **Chamomile (*Matricaria recutita*)**

Chamomile has its origin in Africa, although it is currently cultivated in various regions of the world. This plant can reach a height of up to 100 centimeters. Its leaves are oval, fleshy and have a velvety texture, with star-shaped edges. They measure between 5 and 10 centimeters long and 4 to 8 centimeters wide. The flowers grow in clusters that vary between 10 and 30 centimeters, presenting colors ranging from pale blue to lilac or pink. It is cultivated at altitudes ranging from 0 to 2,500 meters above sea level [10, 12].

Chamomile is used to combat parasites and worms; it is prepared kneaded and consumed with lemon. In addition, it helps regulate cholesterol and eliminate fat. To treat dizziness, it is recommended to drink it blended in water. It is also used in cleaning the home using incense, in infusions to relieve coughs and in treatments for nervous disorders. When applied to the face, it can help in the treatment of acne, and in case of insect bites it is used in poultices on the affected area. It has been observed that it stimulates memory and is beneficial for ear inflammation, since it is cooked and a few drops are applied to the area, [5]. The Kankuamo community frequently uses it to relieve stomach pain. It is suitable for people with high levels of uric acid.



### Oregano *Plectranthus amboinicus*

Oregano is a plant that belongs to the Labiatae family. Its oval-shaped leaves range in size from 6 to 8 millimeters. This plant thrives in humid environments, which explains its frequent presence on the banks of rivers. The aroma of its leaves is intense, and its stems have a creeping growth [10, 13].

In addition, oregano is used as a medicinal plant, recognized for its properties to relieve flu, facilitate the expulsion of phlegm, purify the body and treat digestive problems. By boiling milk and adding this herb, a remedy is obtained that helps combat insomnia. Horsetail (*Equisetum bogotense*)

Horsetail belongs to the Crassulaceae family, which mainly groups succulent plants capable of storing water in their leaves or stems. Its origin is found in southern Africa and Madagascar. The leaves of this plant are fleshy, reaching lengths between 5 and 20 cm, as well as widths that range between 2 and 12 cm. Its color varies between green and yellowish green, occasionally presenting purple edges. The leaves are wide and have a scalloped edge, and between one and three leaves can emerge from each node. The plant has robust stems and its flowers, which appear in hanging, bell-shaped clusters, can be greenish yellow to pinkish red and measure up to 7 cm long. Its growth varies between 30 cm and 200 cm, and it develops at altitudes ranging from sea level to 2600 meters above sea level [10, 14].

As for its medicinal applications, it is used in infusions to treat tumors, abscesses, colic, kidney problems and diarrhea. To combat hypertension, it is consumed in combination with lemon, and for headaches, it is crushed and applied to the affected area, [7]. In addition, it can be used cooked, raw or in the form of juices to help in the fight against cancer. It is also attributed with properties to attract good luck.

### Ginger (*Zingiber officinale*)

This is a perennial herbaceous plant that is distinguished by developing a bulbous and branched rhizome underground, which is used for its properties. These rhizomes can reach up to 10 centimeters in length.

The flavor of ginger is particular, with spicy, peppery and aromatic notes, as well as a hint of lemon and pepper. As the cooking time is prolonged, ginger becomes spicier. Its leaves are elongated and have simple venation, while it produces yellow flowers grouped in clusters [8].

Ginger is appreciated for its anti-inflammatory and digestive properties. Several studies have corroborated its effectiveness in relieving nausea and digestive discomfort. Peer-reviewed research has shown that bioactive compounds present in ginger, such as gingerols and shogaols, have a significant impact on reducing inflammation and may be beneficial in the treatment of chronic inflammatory diseases, such as arthritis, [15, 16].

### Marijuana (*Cannabis sativa*)

Marijuana is a plant known for its content of several bioactive compounds, among which tetrahydrocannabinol (THC) and cannabidiol (CBD) stand out. These compounds are responsible for generating relaxation, well-being and euphoric effects, [17]

Various scientific studies have shown that the consumption of marijuana can offer a variety of therapeutic benefits. In this sense, its active substances, especially CBD, have been integrated into medicine to address various conditions. Therapeutic uses include the relief of chronic pain related to arthritis, fibromyalgia or migraines; Reducing inflammation in diseases such as irritable bowel syndrome, psoriasis, Crohn's disease, and rheumatoid arthritis; alleviating nausea and vomiting caused by chemotherapy treatments; stimulating appetite in patients suffering from AIDS or cancer; treating seizures in people with epilepsy; decreasing muscle stiffness and neuropathic pain in individuals with multiple sclerosis; relieving pain in terminally ill cancer patients; and improving sleep quality in cases of insomnia, among others. [17, 18].

## 4.2. Sustainability

Despite the cultural wealth and valuable knowledge they possess, multiple factors have been identified that threaten the conservation of these medicinal

practices. Among them, the loss of natural habitat, the introduction of exotic species that compete with native plants, and the lack of recognition and support at the institutional level stand out. These challenges not only put the biodiversity of the region at risk, but also threaten the continuity of an invaluable cultural legacy that has been fundamental to the health and well-being of the Kankuama community. It is therefore imperative to implement conservation and valorization strategies that guarantee the preservation of these ancestral practices and the associated knowledge, thus ensuring their legacy for future generations.

### Current challenges in the Preservation of the use of indigenous healing plants

Modernization and the loss of territories have had a profound impact on the herbal medicine practices of indigenous peoples. As industrialization advances and urban development expands, many communities have experienced a drastic reduction in their natural spaces, resulting in a significant decrease in the availability of traditional medicinal plants. Phenomena such as deforestation, environmental pollution and the exploitation of natural resources have contributed to the decline in biodiversity, putting the preservation of these ancestral practices at serious risk.

Furthermore, the growing influence of Western medicine, coupled with the lack of recognition of indigenous herbal medicine as a legitimate health system, has endangered many of these traditions. The lack of access to resources, the discrimination suffered by indigenous communities and the absence of government support have complicated the transmission of this ancestral knowledge to future generations. This situation not only threatens the continuity of these practices, but also weakens the connection of indigenous peoples with their cultural and spiritual roots.

It is imperative that effective measures be implemented to protect indigenous territories, promote the conservation of biodiversity and ensure respect for and preservation of the herbal medicine practices of indigenous peoples. Collaboration between indigenous communities, government agencies and international organizations is essential to address

these challenges and ensure the continuity of this invaluable cultural legacy. Promoting intercultural dialogue and strengthening policies that recognize and value indigenous herbal medicine are crucial steps toward safeguarding this intangible heritage, which not only enriches indigenous communities, but also contributes to cultural diversity and global health.

### Biopiracy and the Protection of Intellectual Rights of Indigenous Communities

Biopiracy stands as a significant threat to herbal medicine practices that have been developed and preserved by indigenous peoples over the centuries. This phenomenon is characterized by the unauthorized appropriation of traditional knowledge and genetic resources by external companies or institutions, which act without the consent or fair compensation to the indigenous communities that have maintained and transmitted this valuable wisdom over generations, [19, 20].

In this context, indigenous peoples are immersed in a constant struggle for the recognition and protection of their intellectual rights, which include control over the use and commercialization of medicinal plants and their derivatives [19]. The lack of effective regulations, as well as the weakness in the implementation of protection mechanisms, have facilitated the exploitation and misuse of these resources, often without providing equitable benefits to the original communities that are the true guardians of this knowledge.

It is therefore essential to strengthen legal mechanisms and international agreements that safeguard the traditional knowledge of indigenous peoples. In addition, it is vital to promote appreciation and respect for herbal medicine, considering it as an integral part of the cultural heritage of these communities. Public awareness, education and international solidarity are key elements to support the struggle of indigenous peoples to defend their rights and preserve their rich medicinal heritage, [20].

In this sense, there is a need for institutions and society as a whole to recognize the intrinsic value of herbal medicine and the fundamental role played by indigenous peoples in its conservation. Failure

to consider this knowledge not only undermines social justice, but also implies an irreversible loss of cultural and biological diversity. Therefore, it is imperative that public policies and legal frameworks be oriented towards inclusion and respect for ancestral knowledge, fostering an intercultural dialogue that recognizes the importance of this knowledge in collective health and well-being. Thus, defending the rights of indigenous peoples in the field of biopiracy is not only a matter of justice, but also an ethical imperative that seeks to preserve the cultural diversity and natural resources of the planet. Cooperation and commitment by all parties involved are essential to achieve a fair balance that benefits both indigenous communities and society as a whole, ensuring a future in which herbal medicine and traditional knowledge are recognized, respected and protected.

## 5. Discussion

Traditional knowledge and sustainability of Kankuama medicinal plants constitute an invaluable cultural legacy and a comprehensive orientation towards health and well-being. The Kankuama community has cultivated a deep understanding of the regional and local flora over generations, as well as experienced healing practices. This ancestral knowledge is based not only on experience and observation, but is also closely related to their worldview, spiritual practices and the interconnection between humans and nature [2, 5, 6].

The sustainable use of medicinal plants is crucial to preserve both the biodiversity of the region and the knowledge that has been passed down from generation to generation. By implementing sustainable practices in the collection and use of these plants, the Kankuama community not only guarantees the availability of resources for future generations, but also fosters a harmonious relationship with nature [5]. Sustainable practices include responsible collection, which respects the growth and reproduction cycles of plants, as well as the promotion of crops that do not harm the local ecosystem. In a context where globalization and industrialization threaten numerous local traditions, the study and valorization of traditional Kankuama knowledge emerge

as essential tools for cultural conservation and the promotion of sustainable health.

The diversity of medicinal plants in the Kankuama community not only reflects the biological richness of the region, but also the deep bond that the Kankuamos maintain with their natural environment. This bond is manifested in their relationship with the land, in which each plant is not only seen as a resource, but as an entity with which a spiritual connection is established. The transmission of knowledge about the use of these plants is fundamental for the preservation of their culture and their health system. Through rituals, stories and teachings, the elders of the community share their knowledge with the younger ones, ensuring that practices and wisdom are not lost over time. [5, 8].

However, external factors that put both the species and the associated knowledge at risk are worrying. Habitat loss due to agricultural expansion and urbanization, together with the lack of effective conservation policies, threaten the continuity of these practices. Deforestation and the use of agrochemicals not only compromise the health of the ecosystem, but also directly impact the quality of medicinal plants that have been used for centuries. Therefore, it is essential to promote the valorization of this traditional knowledge, promoting education and awareness programs that involve new generations and the community in general.

In addition, the creation of support networks that integrate the Kankuama community with researchers, non-governmental organizations and public policies can be fundamental to strengthen their capacity to preserve and promote their ancestral knowledge. These alliances can contribute to the development of initiatives that recognize and protect community intellectual property over traditional knowledge, thus encouraging its responsible and sustainable use.

Finally, it is important to recognize that traditional knowledge not only has intrinsic value for the Kankuama community, but also offers valuable lessons for the modern world in terms of holistic health and environmental sustainability. The integration of these practices into contemporary medicine

could provide effective and sustainable alternatives to address various health problems, while respecting and valuing the wisdom of indigenous peoples. In this sense, the Kankuama legacy becomes a beacon of hope and a model to follow in the search for a life more balanced with nature.

## 6. Conclusions

Research on the diversity of medicinal plants in the Kankuama indigenous community has highlighted the relevance of this cultural heritage to the health and well-being of its members. Through the identification and documentation of these plants, not only the richness of their traditional knowledge has become evident, but also the urgency of acting against the factors that threaten their conservation. To ensure the sustainability of medicinal practices, it is essential to implement strategies that integrate biodiversity conservation with the strengthening of indigenous knowledge. In this way, it will contribute not only to the preservation of the cultural heritage of the Kankuama community, but also to the promotion of a more holistic approach to health that respects and values ancestral traditions.

The conclusions derived from this qualitative and ethnographic study can be summarized in the following key statements. First, it is highlighted that medicinal plants play an essential role in indigenous cultures, where they are used both in traditional treatments and in healing rituals.

Secondly, it is observed that the transmission of knowledge about medicinal plants occurs from generation to generation, mainly through oral tradition and direct observation of nature. This teaching and learning process is vital for the preservation of this knowledge.

In addition, it is highlighted that in the indigenous worldview, medicinal plants are considered sacred, since their use is not only limited to healing the body, but also has an impact on strengthening the spirit and maintaining balance with the natural environment.

Likewise, it is evident that ancestral knowledge related to medicinal plants is protected through

selective transmission within the community. In certain cases, this is complemented by the use of collective intellectual property mechanisms, which seek to safeguard this traditional knowledge.

Finally, indigenous communities face various challenges, such as cultural appropriation, deforestation and the lack of recognition of their traditional knowledge in the area of the use of medicinal plants. These challenges put at risk the continuity of their ancestral practices and knowledge, as well as their relationship with nature.

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