

Socio-cultural components related to the cropping, harvesting, and brewing of guayusa (*Ilex guayusa* Loe) for consumption in Amazonian Kichwa communities of Napo province, Ecuador

Alejandra Espinosa Andrade

alejaespinosa@gmail.com

Universidad de Las Américas

Wilson Vásquez

Universidad de Las Américas

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Abstract

Background

Guayusa (*Ilex guayusa* Loe) is an Amazonian plant whose leaves contain chemical compounds with therapeutic and energizing properties. For the Kichwa nationality in Napo, the guayusa plant has traditionally been considered a fundamental part of their culture. In the last decade, the export market for the plant has been increasing, which has implied transformations in the cropping, management, and use of the plant. The main objective of this study was to identify and describe the practices and beliefs about the planting, harvesting, brewing, and benefits of guayusa among Kichwa families in Napo within the current context. The study of these practices and beliefs allowed us: a) to identify the values and cultural transformations associated with the use and management of the plant, and b) to detect new research topics to deepen our knowledge about the plant.

Methods

The methodology was qualitative using the specific following techniques: literature review, 18 semi-structured in-depth interviews with key actors and guayusa producers belonging to the Kichwa nationality, and field observation of guayusa crops and Kichwa family houses.

Results

The analysis shows that Kichwa families currently maintain some ancestral practices related to the crop management of the plant and its benefits. At the same time, the families' consumption and ceremonial use of guayusa have undergone transformations.

Conclusions

Nowadays guayusa's consumption transcends familial and ceremonial spaces, and it is brewed in different ways. Practices such as the analysis of dreams or punishment with tobacco and chili when drinking guayusa are not frequent. People are planting guayusa in order to sell it in national and international markets. These changes are perceived as a challenge to the preservation of Kichwa people's cultural identity. In terms of the plant's benefits, the endowment of energy and elimination of sleepiness, laziness, body aches, and hunger are highly valued. This study raises new questions about possible future research concerning the plant's cultural, social, medical, and economic aspects.

BACKGROUND

The Province of Napo and the Kichwa Nationality

Napo is located in the Amazon region of Ecuador. Its fauna and forest heritage are represented by parks and protective forests: 71.1% of the area has some kind of conservation category (1). The province has 131,675 inhabitants (2), of which 81.6% live in multidimensional poverty (3) and 63% reside in rural areas (1). In terms of ethnic self-identification, 64.95% of the population identifies itself as belonging to Indigenous nationalities or people (4), and of this percentage, 90% corresponds to the Kichwa nationality (1).

Historically, the Kichwa occupied various areas of the province, and, as a result of colonization in the 1970s, they were displaced or moved to inaccessible areas in order to protect themselves from settlers (1). They are currently located mainly in the southern part of the province: in the cantons of Archidona, Tena, Carlos Julio Arosemena Tola, and in urban areas.

In terms of socio-cultural characteristics, the main language used by the nationality is Kichwa, with Spanish as the second language. Their current form of organization has its origin in the ayllu (family group) and the muntun (extended family); several families make up a community (5, 6). Previously, each group had a shaman (or yachak), who assumed the role of wise man, traditional doctor, healer, spiritual guide, social axis, and political authority (6, 7). Currently, the political organization is based on guidelines established by the state and each community has a board of directors with its respective president and vice-president. Their traditional economic activities are agriculture in the chakra system, hunting, fishing, fiber weaving, and ceramics (1, 8).

The cosmovision of the Amazonian Kichwa nationality of Napo and the ancestral practices derived from this cosmovision are extensive and have been described by several authors. Among them, we can highlight books and articles published by M. Uzendoski (9–12), Andy et al. (13, 14), and university theses (15–17). These explore diverse topics such as mythology, rituals, language, the relationship between space and nature, clothing, economic activities, and their relationship with extractivism.

The use and consumption of the guayusa plant originate in the ancestral Kichwa cosmovision, which encompasses conceptions of the world that are different from current Western logic and epistemology. Their cosmovision and ancestral practices, for various reasons, have transformed over time, and along with this, the management and consumption of the guayusa plant have also undergone changes.

The Guayusa Plant

Guayusa (*Ilex guayusa*), also called waiza, waysa, or wayusa (13), is a tree/shrub-type plant (18) that occurs in the Amazon region in the wild and in some subtropical locations in cultivated form (19). It can be found in Ecuador, Colombia, Peru, Bolivia (20, 21), and even Oceania (22). It is estimated that there are more than 500 species (23). In Ecuador, guayusa is present in the Amazonian provinces of Sucumbíos, Napo, Pastaza, Morona Santiago, and Zamora Chinchipe, and also in the Andean provinces of Pichincha and Tungurahua (22). In Napo, guayusa is found in the middle and lower zones of the province (300–1,000 m.a.s.l.) and is widely consumed by Kichwas, White settlers, and Mestizos.

Regarding its chemical composition, the leaves of the guayusa plant contain antioxidants and methylxanthines, which are bioactive compounds that stimulate the central nervous system, increasing motor activity and intellectual performance and reducing fatigue and sleepiness (24). The main components found in its leaves are caffeine, theobromine, phenolic compounds, and flavonoids (21). Radice et al. (25) provide an excellent review of studies related to the phytochemical and pharmacological composition of guayusa. The benefits of guayusa consumption include its effects on metabolic, autonomic, and oxidative stress in diabetes (26) as well as slimming (27), anti-microbial (28), anti-inflammatory, antioxidant, and stimulant properties (29). Guayusa tea has hypoglycemic activity in patients suffering from type II diabetes mellitus (30), among others. It has also been established that there is a low risk of guayusa contamination by mycotoxins, bacteria, or pesticide residues (31) and that guayusa consumption does not produce adverse effects (32). However, it has been mentioned that excessive consumption can cause sleep problems and heart rhythm problems (24) and that it can cause trances and visions (13), so further research is needed.

Regarding the historical use of guayusa, archaeological material has been found in a Tiahuanacoid tomb in highland Bolivia dating back to 500 AD, where the use of guayusa in burials is evidenced (33). This implies two important aspects: 1) the plant had a ceremonial value, and 2) it was sent from warm lands to high-altitude regions, which shows that guayusa had an exchange value in pre-Hispanic societies. There are accounts from the 17th century describing the mixing of narcotic plants (e.g., *Datura* and *Banisteriopsis*) with guayusa and tobacco by Indigenous people in medicinal and ritual contexts (23, 34). It is also known that in Jesuit missions, guayusa was an important source of economic income (21). Among Indigenous people, guayusa was used to stay awake, increase fertility, treat amenorrhea, regulate the menstrual cycle, cleanse the stomach, and cure venereal diseases, alongside its use as a purgative, diuretic, narcotic, hypnotic, anesthetic, anti-anemic, and anti-witchcraft medicine (35), and as a good omen and dream-inducing drink, and as a drink consumed before hunting and fishing (23).

In Ecuador, various Indigenous communities use this plant in different ways. For example, the Achuar people consume it as an infusion to improve hunting skills, and it is also mentioned that this community makes a poisonous drink based on guayusa and guava (36). The benefits attributed to guayusa by Amazonian Kichwa communities (14) are as follows:

[We] use it to relieve body aches, to purge the stomach, to avoid snake bites, and in the case of the hunter to acquire skills in the jungle. In the same way, hunters who for some reason have acquired bad omens bathe with water boiled from the leaves of this plant. This brings them back into balance with nature (14).

The intake of guayusa is also linked to hard work within the Kichwa community, as the plant is attributed with the ability to connect mind, body, and spirit, bringing various benefits such as more energy, concentration, and vigilance (24). The study by Dueñas et al. (37) describes the benefits mentioned by Kichwa people, namely as a stimulant, stomach tonic, diuretic, flu remedy (in combination with ginger, chuchuwasi lime, and/or sugar cane liquor), cure for venereal diseases, blood cleansing, improved digestion, increased appetite and increased fertility in women, oral cleansing, and avoidance of insect bites. Regarding the latter, it is stated that the Kichwa would put guayusa infusion on their legs and arms as a repellent. Some Kichwa even wash their dogs' faces with guayusa so that they will dream and become good hunters (20). It is also used for baths, washing the face, purifying the body, preventing aging (13, 22, 38), removing chiki (i.e., bad omen or misfortune) (13, 39), and for baths together with other plants after childbirth (14). Guayusa leaves can also be mixed with ayahuasca (14), and there are mentions that guayusa leaves, mixed with orange, have been used as incense in ceremonies (40).

In the Kichwa cosmovision, it was believed that the discovery of guayusa was thanks to a yachak apprentice, who, after walking long stretches through the forest, noticed that it had started to rain. He found a leafy tree and fell asleep. Between dreams, the spirit of the tree appeared and told him to chew its leaves and that would help him stay awake, have a lot of energy, protect him from animals (including snakes), facilitate a good hunt, and improve his health. The spirit identified himself as Guayusa and made the yachak wake up and continue on his way (41). Before becoming a sacred plant, Guayusa was a divine being that instilled courage, lifted people's spirits, stimulated wise decision-making, and conferred the joy of living and succeeding (42).

The guayusa-taking ritual has been described in several studies (13, 24, 43). It is a custom that some Amazonian communities, such as the Shuar, Achuar, and Kichwa, have in common. The ritual consists of getting up at dawn, making guayusa tea over an open fire, sitting around the fire, and drinking the infusion while the elders tell their stories, legends, and experiences of the jungle (44). In the family ritual, all members participate and it is a space where reflection is sought, the day's activities are planned, dreams are interpreted (13), and weavings are made using plant fibers to create utensils such as fishing nets, shigras, or ashanga baskets (24). In this ceremony, chili is also applied to the eyes of children and young people as a form of punishment (14, 20).

Both the harvest and the brewing of guayusa have been described as activities carried out by women (1, 13, 20), which is framed within the division of tasks among the Kichwa: "Activities are done in groups, with separate tasks for men (construction, fishing, hunting, etc.) and women (domestic activities, chakra work, raising children, etc.). Comparatively, when it came to agricultural activities, women were the ones who worked the most" (14). Guayusa cultivation is associated with the chakra production system, which is defined as:

a productive space located within the farm, managed by the family under an organic and biodiverse approach, valuing ancestral knowledge, where there is timber, fruit, handicraft, edible, medicinal, and ornamental species, as well as endemic and domestic fauna. The distribution allows a balanced and

sustainable production that serves for family consumption and commercialization, conserving the agroecological and cultural management of the productive processes, while avoiding monoculture production (1).

The chakra is a living space around which the Kichwa community revolves. Currently, a chakra has a minimum extension of 0.25 hectares to a maximum of 1.5 hectares and can contain between 50 to 90 species of plants (E14), including yuca, plantains, peanuts, beans, chonta, and guayusa. The chakra is mainly managed by the chakramama (or chakra woman) with the participation of the family (1, 14, 45). Traditionally, mothers and grandmothers give a guayusa plant to young women when they decide to start their own families and chakras (24), and this tradition is passed on from generation to generation. The men who manage the chakra are called chakrayaya (idem).

Guayusa leaves, due to their benefits for people, have been traded for several years in Ecuadorian markets (46); however, it is only since 2010 that guayusa exports have been registered and the market has been increasing ever then (47). Guayusa is currently used for the production of processed products, such as infusion sachets, energy drinks, and other derivatives; however, further studies are needed on its benefits and post-harvest management (48).

In this context, the present study aims to understand the management practices and current beliefs about the cropping, harvesting, brewing, and benefits of guayusa in the Kichwa families of Napo. The study allowed us: a) to identify the cultural values and transformations associated with the use and crop management of the plant, and b) to detect new research topics to deepen our knowledge about the Kichwa culture of Napo and guayusa in particular.

Our study focuses on the current context and detailed vision regarding the management and use of guayusa in Kichwa communities by considering the complete cycle of production, collection, brewing, and consumption. The relevance of this analysis lies in the need for and importance of keeping a written record of the history of the Amazonian peoples and nationalities of Ecuador, specifically their relationship with the use of native plants and their consequent transformations.

The research is part of the project "Study of the genetic, chemical, and morphological variability of guayusa (*Ilex guayusa*) in the chakras of the Kichwa communities of Napo Province" which is carried out by UDLA.

METHODS

The methodology used was mainly qualitative. The techniques used were: a literature review, field observation, and semi-structured in-depth interviews with key actors belonging to the Kichwa nationality regarding the production and consumption of guayusa. Each technique is detailed below.

- - Bibliographic review: Books, articles, and research related to the guayusa plant and ethnobotanical characterizations of the plant were analyzed, including, in some cases, socio-cultural descriptions associated with guayusa.
- - Interviews: 18 interviews were conducted with key actors (11 men and 7 women) related to the cultivation and management of guayusa, most of them members of the Wiñak Association. This association brings together Kichwa producers and promotes environmentally friendly practices, including the traditional production of guayusa in the chakra to preserve the Kichwa culture, identity, and cosmovision (49). The number of interviews conducted followed what is known as "saturation point", that is, interviews were conducted until no new information related to the objectives was obtained. The questions covered the following topics relating to guayusa: cropping and harvesting; brewing and consumption; family/ritual use; and main transformations. The information provided by each interviewee was used anonymously; each interviewee is identified in the text with the acronym E followed by a number.
- - Field observation: Five field visits were made to the province of Napo during the period Sept 2022–Sept 2023. The objective of these visits was to conduct in situ interviews and observe the guayusa crops and the relationship between the producers and the plant. In March 2024, a visit was made to present the results to the Kichwa producers in the city of Archidona.

The study was conducted following the ethical principles established by the Ethics Committee for Research Involving Human Subjects (CEISH) of the Universidad de Las Américas, also taking the Declaration of Helsinki and the code of ethics of the International Society of Ethnobiology as guiding principles for research work. In the latter, Principle 1 stands out, which recognizes that Indigenous peoples have interests, responsibilities, and property rights over all ancestral knowledge, traditional resources, and their uses.

In the following pages, we present the results, discussions, and conclusions of the study.

RESULTS

Planting, harvesting, brewing, and consumption of guayusa by the Kichwa communities of Napo at present

This section summarizes the main results/findings of the study related to the planting, harvesting, brewing, and consumption of the plant by the Kichwas of Napo, based on the interviews carried out.

1. Planting and harvesting of guayusa

Traditionally, Kichwa families have guayusa plants that they originally received from their grandparents or parents (E10, E14, E17). In other words, it is a plant with a hereditary component that is passed on from generation to generation. This passing on of the plant can be done in two ways. The first way is that parents give their children, who are about to marry, a bud of the plant that they have in their chakra so that their offspring can plant it in the new

chakra. The second way is that fathers and mothers give a part of their chakra, which already contains a guayusa plant, as an inheritance to their sons and daughters (E16). For this reason, there is always a reference to the existence of at least one “mother plant” (E6, E14, E16), from which the families obtain shoots to plant next to the house and use for personal consumption (E6). Generally, it is not necessary to plant more guayusa plants because one or two plants at home are enough (E6, E17). Previously “(...) guayusa was considered a sacred plant by the community, and they had one per community, sometimes two [...]. Everyone harvested the leaves and took them to brew it [...] because each community is a family” (E14). Since 2012–2013, they have started to reproduce and plant guayusa in the chakra with the aim of marketing it, with some families sowing it as a monocrop (E14). However, at present, due to a lack of buyers, some families have stopped harvesting the plants (E13).

A branch (35 cm long) of guayusa can be planted in the chakra at any time of the year and does not require any special care (E3, E6). It is preferable to plant it in “black soil,” which is considered fertile, and not in “yellow soil,” which is considered poorly fertilized (E9). It is also preferable to plant it in a corner of the chakra, as when they grow, their roots become large and hard (E17). The soil must be cleaned (E3, E9, E10), which is done by hand, with a machete, or with a strimmer (E13). Some Kichwa producers mention that it should be planted without shade (E6) and others with “not much shade, but in some shade...” (E13). No specific distance from other plants is considered: “I plant this way in the spaces I have,” said one interviewee (E6). There are no considerations as to which species the guayusa should be planted next to, nor with which species it should be avoided. However, if guayusa is planted with trees around it, the leaves can get dirty: “It gets covered, it looks very ugly, the little black leaf can remain” (E10). The plant is not in danger of being invaded by animals or insects, and if it is sprayed with chemicals, it is damaged and not good for consumption (E13).

The Wiñak Association has established as one of its objectives to work in an environmentally responsible way, so it does not use chemicals or other synthetic inputs to prevent pests in its crops. For this reason, producers avoid planting guayusa near plants that use chemicals, as this could lead to contamination of the guayusa plant (E9). Diversification of species within the chakra system is believed to be beneficial for its growth, as the plant does not have to compete for nutrients. On the contrary, if guayusa is in monoculture, this may lead to leaf chlorosis and slower development (E14). The need to confirm this observation of the interviewees with scientific studies was mentioned (E14).

Regarding the care of the plant in the chakra, it does not require particular attention (E6). It is mainly handled by women (E14, E17), while the men perform the most physically challenging work, such as felling trees, carrying the plants, and clearing the land (E17). The current typical scenario is that the man works outside the home in urban activities, like carpentry or masonry, and the woman stays at home to be in charge of the chakra and household finances (E17).

In terms of harvesting times, this can take place after four to five months (E5), seven months (E3), one to two years (E14), and even three years (E3). The time will depend on geographical location and soil fertility (E14). One plant can be harvested every 4 months (E3). Up to 3 sacks of leaves can be obtained from a single plant (E3); each sack is on average 25 kg. It has been stated that guayusa is harvested at any time of the day (E5, E10, E13), yet the morning is preferable, as this way it is possible to observe any damage to the leaves (E3). Only “clean” leaves are consumed or sold (E13).

The day or time of harvest does not affect the benefits of the plant (E10). People harvest the “good leaves,” which should be clean, coarse-textured, and ripe (E12). They differentiate between the tender-young green leaf and the mature leaf, which is dark green and in the middle part of the branch (E13, E9). In terms of taste, all guayusa leaves are the same, only some have a more bitter taste (E10). There is a difference between drinking guayusa made with younger leaves and that made with mature leaves (E12). It was affirmed that it is better to drink an infusion of mature guayusa leaves (E9, E13), as the tender leaves are less flavorful (E13). There is also a distinction between thin leaves and broad leaves (E6), the most “effective” being the thin leaves (E6).

The harvesting of guayusa can be carried out by any family member (E13), but it is mainly done by the women— the mother or grandmother (E10, E13, E18). Regarding the life span of the plant, it is considered a plant that “does not die,” that it is a perennial plant (E10, E14). E3 reports plants aged 56 years; however, there older plants do exist (50). In the study of genetic variability, plants of more than 100 years were found since the Kichwa communities indicate that they are three-generations old (51).

2. Brewing and Consumption

Brewing

Grandmothers got up earlier. At two in the morning, three in the morning, they would light their little candle and the guayusa was always there. They had the guayusa [in] a little pot there. That was sacred to them; it was not to be touched. [...] So, they would get up at the appointed time, and, before going to sleep, they would light the tulpa and the guayusa there. The guayusa had to boil until she woke up. The guayusa would stay warm, all night long, yes. And that’s why the next day, when they drank the guayusa, it was black and bitter. So, they said that the guayusa was the good one, that is, as the companions said, it protected us from snakes, wasps, even from evil spirits [...] (E15).

The above description summarizes the traditional way of brewing and consuming guayusa tea. Other consumption methods, such as, for example, putting the leaves directly on the body or eating the leaf as food, are not mentioned at present. Although the making of the beverage may differ from family to family, the brewing methods follow distinguishable patterns, which are described below.

Once guayusa is harvested, the drink can be made using fresh or dried leaves, tender or ripe leaves (E17, E9). This depends on taste (E9, E1, E3). The ancestral and traditional way of drinking guayusa is mainly using dried leaves. There are different ways of drying the leaves. There are families that allow the leaves to dry for two or three days (E5), a week (E13), or a month (E10), either in the sun or inside the house, often the kitchen (E1, E10, E13). The most

common way is to dry the guayusa leaves near the fire (E1, E6). Each family has a fire pit in their house of about 60 cm in diameter, near which a branch of guayusa is hung so that it gradually oxidizes with the heat of the fire (E1, E3, E6, E15). This “oxidized” guayusa is taken, boiled, covered, and drunk (E1).

To dry guayusa, some families make *sartas* (E16, E17): small holes are made in the freshly harvested tender guayusa leaves, through which a thread is passed and a sort of necklace of leaves is formed. The guayusa is then left to dry either indoors or outdoors (E13). When the leaves are dry, they can last between fifteen days and a month (E5).

Traditionally, the woman is in charge of making the guayusa drink (E1, E10, E18) and serves it to all members of the family, a ritual that is mainly passed from mother to daughter (E18). Nowadays, men also get involved in the brewing process (E1, E5, E10). To make guayusa tea, a cup of leaves is placed in a pot of boiling water over the fire (E6, E7). The pot used exclusively to make the guayusa drink is called *waysamanga* or *tulpa* (E15, E16), and this is placed over the fire. The cup in which the guayusa is drunk is called a *pilche* (E1). The boiling time varies between 10 (E1), 20, and 30 minutes (E10, E13). When the smell of the leaves comes out, it means that the drink is ready (E10). If the leaves are dry, the smell comes out quickly (E6).

When the drink is made with green leaves, the leaves are harvested in the morning and boiled immediately, i.e., guayusa is made as a tea: the leaves are boiled in water and left covered for about ten minutes so that the compounds are extracted and the caffeine takes effect (E1, E10). This form of brewing is more recent: as mentioned above, the more traditional brewing method is by drying the leaves first.

Regarding the differences in the color of the drink, when it is made with mature and dried leaves, the water comes out a darker brownish-black color (E3, E9, 10) than when the leaves are green. Regarding the taste, with ripe and dried leaves, the taste is considered better (E5, E6, E13) and more bitter (E10). In terms of the effects produced by the different leaves, the interviewees affirm that these are the same (E3). However, in terms of intensity, it was mentioned that the more effective brew is “green” boiling (straight from the plant to the pot) due to the thermal shock and the longer boiling time (E1). On the other hand, it is also mentioned that “it is not the same to drink guayusa from an old tree than from a young tree; guayusa from the old tree is more loaded” (E1 in E9). Others mention that grandparents keep the guayusa leaves in the pot, which makes the drink stronger (E17). There are families that make guayusa tea the evening before and leave it to concentrate until the next day when they heat it and drink it (E1), and other families leave the guayusa in the pot all day (E6). When the guayusa is left to rest, it takes on a darker color and its effect is stronger (E6). This guayusa with a longer resting time is called *guayusa tinta* (E6, E18). A Kichwa informant mentioned that “at the moment of drinking the beverage, first the guayusa has to be well cooked, *tinta* [dark]. You rinse your mouth a little and spit it out. [...] Then, the tea is usually drunk” (E18).

Table 1
Guayusa brewing and intake

SUBJECT	INTERVIEWEES RESPONDING TO THE TOPICS
Tim of brewing and first drink	
“Early morning”	E1, E6, E13
1–3 am	E4, E5, E6, E11, E15, E17
4–5 am	E6, E7, E9, E13, E16, E17
5–6 am	E7, E10, E17
Drunk at any time	E5, E7, E13
Who makes it?	
Woman (mother/grandmother)	E1, E3, E4, E10, E15, E16, E17, E18
Man	E9
Both woman and man	E1, E5, E10
Who drinks it?	
Both men and women	E7
Mainly men	E5
Women don’t like it, women don’t drink it, or women don’t drink as much as men.	E5, E6

Authors’ own. Source: interviews with producers and members of Kichwa communities in Napo.

Consumption

There is no consensus on the age at which people start drinking guayusa. The age can vary between 1 year (E3), 2–3 years (E7), 6 years (E9), 8–10 years (E1), and 15 years (E5). It seems, then, that drinking guayusa has no known negative effects on minors; children drink it “when they want” (E7) and if they do not drink it, it is “because they do not want to” (E5). The custom of children drinking guayusa has been lost, mainly in the communities closest to the cantonal capital (E1). No restrictions are mentioned for drinking guayusa tea; it can even be ingested during pregnancy (E1, E10). Animals do not drink the tea or eat the guayusa plant (E3, E7).

Regarding the frequency and ways of drinking the beverage, the traditional/ancestral way is to drink it hot, without sugar (E1, E3, E17, E18), and in the early morning hours, when the day starts for Kichwa families. Their day usually starts between 1 and 5 am (see Table 1). This first cup of guayusa can be drunk with bread (E7), and some families later drink a cup of chicha de yuca (E3, E4, E6, E13, E16, E17). After drinking guayusa, the day's chores begin. In ancient times, and in some cases to this day, the men went fishing or hunting and the women stayed behind to do housework or traditional activities, such as making shigras (E11).

In terms of frequency of drinking, guayusa can be consumed at any time of the day (E5, E7, E13) and on occasions when you need to stay awake late at night (E3). During the day, it is drunk cold or sometimes heated (E6). Because of its energizing effects, some people prefer to drink it only once a day (E10, E17). It was mentioned throughout the day, people can take a pilche (a cup) as an energy booster (E1). It is the traditional morning drink of Kichwa families, who hardly ever consume coffee (E2, E3).

In the context of festivities, large pots of guayusa are made (E5), and it can be mixed with strong, homemade alcohol (aguardiente) and sugar (E3, E5, E17). Some families mix guayusa with lemon verbena, orange leaves, or cinnamon (E3), and when receiving guests in the house, this drink is also offered to them (E6). Children and younger people are the ones who prefer guayusa with sugar (E1, E3, E4, E7), but in general, this depends on each person's preference (E3, E13).

Guayusa Upina and Ritual Use

Guayusa upina is the time to drink guayusa. It is the time in the morning when, after or during the guayusa, the family interprets dreams and plans what will be done during the day (E1, E3, E4, E6). Dreams are considered to be signs to be taken into account for your future actions. For example, dogs symbolize snakes and danger, so if you dream about them, you have to be alert during the day (E1), but dogs are also positive signs that bring fortune. It was mentioned that guayusa strengthens people's ability to interpret dreams (E1).

Another ritual associated with drinking guayusa is giving advice and punishment to children (E1, E15, E16, E18). In the past, during guayusa upina, the eldest person in the family would gather all his children, and sometimes the grandfather (the rucuyaya) or an older relative or visitor, considered wise or a good hunter, would be invited (E1). It was common to put chili in the eyes of children who had misbehaved (52). This ritual of putting chili in children's eyes is called *uchurina* (E1). The person in charge of *uchurina* was the rucuyaya. The father or mother prepared different plants and had them ready for the grandmother or grandfather to perform *uchurina* (E1, E15, E16). Another punishment that could be used in conjunction with chili was thrashing the child with nettles, and the children had to remain seated, listening to the advice (E1, E15). The idea was to have a moment of "training" for the younger ones by the adults. Another punishment associated with guayusa upina was putting tobacco up the nose (E13). Tobacco, which is also sown in the chakra, was harvested and left to dry by the fire for 10–12 days (E15). Then, the tobacco was cut, crushed, and soaked in water overnight. Some people boiled it. The remaining water is put up the nose, which causes coughing and crying (E1, E15). Tobacco is still used in this way today, as it is thought to be beneficial for treating flu (E15).

Currently, the guayusa upina ritual is performed at the community level (E6, E16, E18). In some communities, they also impose the punishment of chili and tobacco on community leaders who are doing their work badly (E6, E16), or they also take their children to this community ceremony. There are also punishments with nettles or a guayusa whip (E16). After the ritual, there are drum sounds (E6), and there may also be a *pambamesa* where fruits and typical local dishes are served. Sometimes, there are also bundles of herbs, such as lemon verbena, for people to take with them (E18). The ritual of guayusa upina has transcended Kichwa communities and has become a kind of festival to attract visitors to the area. If there is a community celebrating its anniversary, the guayusa upina ceremony is performed in a dramatized style (E15). It has also taken on a political dimension; authorities hold events where the guayusa upina is performed as a big show/festival with music (E1).

The use of the guayusa plant is also associated with shamanic ceremonies. Shamans take yagé (or ayahuasca) and then rinse their mouths with guayusa (E1). Others say that guayusa is drunk before yagé (E6) or guayusa is mixed with yagé (E2, E6). Yagé is a sacred plant that is used only by shamans (E10) and allows them to reach other states of knowledge. Other plants with which yagé is mixed are *amirunca* or *amelronca* (E2). It would be interesting to study whether guayusa contributes to the activation of the properties of yagé in order to produce other states of knowledge.

3.Effects/Benefits Attributed to the Plant

Guayusa is perceived as the pillar of Kichwa culture, a medicinal and sacred plant that has been maintained for generations (E15, E16). "Without guayusa, we are not Kichwa [...]; without guayusa, we cannot live," commented one interviewee (E16). In ancestral times, this plant was only used by the yachak or shamans, those who had the power, the energy of the forest, and the water (E14). One of the people interviewed said:

...I think guayusa controlled the mind, that is, the brain. It was, for example, I remember that my father, when we were already sick, we never went to the health center or hospital, nothing, nothing. Before, it was only the shaman, shaman, shaman. That's who our doctors were, the shamans. So always when [the shaman] came, he would say, 'You have to drink guayusa; give him strong guayusa.' He would drink it, blow on the head, the headache would go away... (E17).

One informant mentioned that the *chiriguayusa* (a particular kind of guayusa, described as a bush with smaller leaves) has stronger effects and can only be taken when one has knowledge of ancestral medicine or if one has some power, like that of the shamans (E18). The *chiriguayusa* could also be mixed with other plants to be used as a diuretic tea and to cure blood-related diseases (E18).

The main properties attributed to the intake of guayusa tea are described in the following table.

Table 2
Properties of the guayusa plant according to Kichwa interviewees.

PROPERTIES	MENTIONED BY INTERVIEWEES
Eliminates sleepiness/laziness	E2, E3, E4, E5, E6, E7, E10, E11, E13, E17, E18
Gives energy/strength	E5, E6, E14, E4, E7, E15, E18
Removes body aches/keeps you healthy	E2, E4, E5, E6, E7, E10, E13
Scares away snakes/makes snakes afraid	E1, E2, E3, E10, E13, E15, E16, E17, E18
Scares away wasps/no wasp stings	E1, E2, E3, E15, E16
Takes away hunger	E4, E5, E6
Makes you happy	E15
Helps you to be aware of animals	E17
Helps in planning activities/work	E3, E5
Increases concentration	E5
Increased virility/desire to have sex	E1
Increased female fertility	E1, E14
Repels evil spirits	E1, E15
The body needs guayusa	E3
Helps eyesight	E15
Beneficial for pregnant women	E15
Helps the stomach/digestion	E1, E15
Repels “tigers”	E15, E17
Keeps your teeth clean	E15
Regulates menstruation	E16
Diuretic	E18
Helps cure blood-related diseases	E18

Authors’ own. Source: interviews with producers and members of Kichwa communities in Napo.

As can be seen, the most mentioned properties are currently related to the provision of energy and the elimination of sleep, laziness, body aches, and hunger, and are corroborated by Silvestrová et al. (53), Gan, et al. (54), Villacís-Chiriboga (42), Pardau et al. (55). Because of these benefits, guayusa is drunk at the beginning of the day, before going out to work (E3) and for jobs that require energy, which in Kichwa communities have traditionally been carried out by men, such as fishing and hunting, and which also require walking long distances (E1).

Unlike coffee, guayusa does not produce addiction or effects of alteration or agitation in the body, even if taken in large quantities (E1, E9). Benefits related to scaring off animals such as snakes, wasps, and “tigers” are also mentioned. To a lesser extent, other properties are mentioned, including making you cheerful, helping you plan activities, aiding concentration, increasing virility in men and fertility in women, warding off evil spirits, improving eyesight, improving digestion, keeping teeth clean, regulating menstruation, curing blood-related diseases, and as a diuretic.

Because of these multiple properties, guayusa is still considered a medicinal plant today. During the COVID-19 pandemic, in order to stay healthy, Kichwa communities did not stop drinking guayusa. It was constantly ingested “so that the throat would not dry up” (E6), along with other plants such as ginger, lemon, chuchuhuaso, huranga, matico (spiked pepper), sangre de drago, lustilda muyu, and uña de gato (cat’s claw) (E6, E14). It was mentioned that the uptake of guayusa also depends on the communities. For example, in the highlands, guayusa is drunk for hunting, in the lowlands for fishing. In the case of the Achuar people, they take guayusa in large quantities to induce vomiting and cure their stomachs (E1). This coincides with what was described by Lewis et al. (56) that in the past, the Indigenous people had the daily practice of purging with guayusa in the morning (33). Also in the past, people in Ecuador have been described as using feathers to induce vomiting after having ingested guayusa (20).

DISCUSSION

From the interviews conducted, the following transformations and/or changes related to the management and consumption of guayusa were detected.

In general, guayusa harvesting in its traditional and ancestral form has been gradually modified. The first significant modification is related to the planting of guayusa for commercial purposes, preserving the chakra production system. Apart from drinking guayusa at the family and community level, families now also perceive it as a source of income (E14).

This implies a modification in the chakra production system, as guayusa occupies a larger physical space for cultivation. Furthermore, it entails a reconfiguration in the local and family economy: on the one hand, the commercialization of guayusa provides additional income for the families; on the other hand, if commercialization is unsuccessful, the plant remains in the chakra without being harvested. The expectation of commercializing guayusa leads Kichwa families to allocate part of their land to monoculture, intercropping, a living fence, among other forms. Currently, the plant is already being marketed in Peru, Colombia, and Ecuador, which has led to a change in the production system (E14). The producers interviewed perceive this as a risk that could change Indigenous customs and cosmovision (E14), while plowing the land, caring for the chakra, and learning the Kichwa language are perceived as essential to Kichwa culture (E16).

In terms of who is in charge of the chakra and guayusa harvesting, it is mainly women, yet nowadays there is more flexibility in these roles. As for how guayusa is consumed, it is mainly used as a drink. Guayusa whips are also made as an instrument of punishment (E16). No use was recorded for baths or direct application to the body. In terms of the way it is made, guayusa used to be boiled with chonta or palm wood, put over a fire, and cooked quickly. The guayusa water was strong and dark (E6). Gradually, families have started using industrial cookers, which, according to Kichwa perceptions, have changed the taste of the drink (E6). Nowadays the tea is made using not only dried leaves, but also fresh, tender, or ripe leaves (E17, E9). Some Kichwa families also make guayusa tea using small tea bags processed by the Wiñak Association (E16).

The custom of children drinking guayusa has been lost, mainly in the communities closest to the cantonal capital (E1). In terms of the ritual of drinking guayusa, the time for drinking it is more flexible. It is no longer limited to the first hour of the day but can be done at any time. This flexibility is mainly found in the urban area, where guayusa is served in shops and restaurants, together with food. Regarding the tradition of sharing and analyzing dreams, this practice used to be carried out mainly by grandparents in the past. Although some families still maintain it, the custom is on the decline. Similarly, some families continue the tradition of punishing their children using tobacco and chili. However, this practice is becoming less common due to the associated risks, such as possible damage to eyesight, which may lead to schools issuing warnings to families who impart these punishments.

At the community level, guayusa upina has also taken on a more commercial aspect; there are now events organized by Kichwa people using the theme of guayusa to attract visitors, such as the “gran Guayusazo Bailable” or the “Guayusa Warmi” contest, where at the end of the event, the winner distributes guayusa among those present.

In the past, for healing purposes, guayusa was drunk very strong and bitter. Nowadays guayusa tea is drunk hot or cold (E6) and at any time (E1); some people prefer to drink it with sugar (E10) and others with sugar or panela (raw cane sugar) and lemon (E13, E16). All these changes are part of the “domestication of guayusa” (E1). Throughout Napo province, it is common for restaurants to offer guayusa with sugar and lemon as the main drink, which is drunk like any other (E17). Nowadays, almost all beverages on the market have high levels of sugar, so the population is also used to sweetened guayusa. In the case of children, they prefer juice to traditional drinks, such as guayusa or chicha (E13). Young Kichwa people who live outside the community for work or studies stop making guayusa in their new home. However, when they return to their community, they drink guayusa and sometimes take leaves with them to brew in their new home.

These changes have various causes: a) transformations in the economic structure at family, national, and global levels; b) the process of urbanization and globalization of the territories where Kichwa families live, which leads to changes in the way communities consume and relate to their immediate environment. Currently, the Kichwa face problems in terms of land ownership, as they have few communal reserves for new families; apart from this, they face economic problems, as the products produced in their chakras are purchased at low prices in the city (7).

The people interviewed highlighted the importance of maintaining the tradition of using guayusa, as they consider it part of their essence and Kichwa culture (E16). Specifically, the Wiñak Association seeks to promote the Kichwa culture so that it is not “lost” (E14, E17), and guayusa is part of this promotion. In 2023, the National Assembly declared March 25th as National Day of Guayusa Upina (57) as a way of maintaining the customs of the Indigenous peoples and nationalities of Ecuador.

Compared to the existing literature on guayusa mentioned in the first part of this paper, this study is a pioneer in considering the guayusa plant from a holistic perspective that takes into consideration not only the current socio-cultural aspects related to the plant but also its relationship with the chakra system. The study also provides a detailed description of the current management of the plant, an aspect that has not been considered in previous studies analyzed for this paper.

Regarding the limitations of the present study, the main one may be that most of the interviewees are part of the Wiñak Association. This association has its own particular point of view regarding the management of the chakra system and guayusa production. They promote responsible and sustainable production, as well as a discourse related to the importance of maintaining the Kichwa culture and cosmovision. For these reasons, this study should be taken as a specific vision of a group of Kichwa people, which is not generalizable to the entire Amazonian Kichwa nationality.

CONCLUSIONS

This study analyzes current practices and beliefs about the planting, harvesting, brewing, and benefits of guayusa in the Kichwa families of Napo. It describes in detail how Kichwa families plant guayusa or receive it from their families, the type of leaves they harvest, and how they are prepared and consumed.

The analysis shows that Kichwa families currently maintain some ancestral practices related to the management of the plant and, at the same time, these practices have undergone transformations in relation to the form of family consumption and ceremonies. Traditionally valued as mainly a family and

community drink, nowadays consumption goes beyond these spaces, and it is made in different ways. Practices such as the analysis of dreams or punishment with tobacco and chili when drinking guayusa are not frequent. Similarly, guayusa is being planted not only for family consumption but also to be sold in national and export markets. These changes are perceived by the interviewees as a challenge to cultural preservation, and they consider it extremely important to keep the guayusa tradition alive as part of their Kichwa identity. In terms of the plant's benefits,

guayusa is still considered a medicinal plant today, they mainly emphasize the endowment of energy and the elimination of sleepiness, laziness, body aches, and hunger, which are highly valued.

The analysis presented opens new questions about guayusa and possible future research topics, such as 1) risks of the expansion of guayusa cultivation in the chakra system (as a culturally and environmentally sustainable space); 2) relationship between guayusa and species diversification (chakra system); 3) relationship between the age of the guayusa plant and its effects; 4) relationship between the maturity stage of the leaf and its effects; 5) other forms of consumption (pills, syrups, ointments, etc.); and 6) the economic and environmental impact of guayusa monoculture on Kichwa families.

Declarations

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Authors' contributions

The first author, AE, was responsible for the literature review, research design, fieldwork, systematization, and analysis of field data. AE wrote the first draft and concluded the final version of the manuscript. WV contributed to the conception of the project, fieldwork, reviewing the literature, drafts, and the final manuscript.

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Availability of data and materials

The data that support the findings of this study are available on request from the corresponding author, Espinosa, A. The data are not publicly available due to ethical reasons since they contain information that could compromise the privacy of the research participants.

Ethics approval and consent to participate

The study was conducted following the ethical principles established by the Ethics Committee for Research Involving Human Subjects (CEISH) of the Universidad de Las Américas (approval code 2022-EXC-002), also taking the Declaration of Helsinki and the code of ethics of the International Society of Ethnobiology as guiding principles for research work. Verbal informed consent was obtained prior to each interview.

Consent for publication

Not applicable

Competing interests

The authors have no relevant financial or non-financial interests to disclose.

Geolocation information

<https://maps.app.goo.gl/LZfyFPpUsm9WsNre7>

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