

## Notes on Economic Plants

# Amazonian Guayusa (*Ilex guayusa* Loes.): A Historical and Ethnobotanical Overview

JUAN F. DUEÑAS<sup>1,3</sup>, CHRISTOPHER JARRETT<sup>\*,2</sup>, IAN CUMMINS<sup>1</sup>, AND ELIOT LOGAN–HINES<sup>1</sup>

<sup>1</sup>Fundación Runa, Inglaterra E3–263 y Amazonas, Quito, Ecuador

<sup>2</sup>Department of Anthropology, The University of Texas at San Antonio, San Antonio, Texas, United States

<sup>3</sup>School of Life Sciences and Biomedical Engineering, Yachay Tech, 100119, Urcuquí, Ecuador

\*Corresponding author; e-mail: chris.c.jarrett@gmail.com

### Introduction

Guayusa (*Ilex guayusa* Loes.) is an under-studied holly species found in the upper Amazon basin of Colombia, Ecuador, and Peru. Societies throughout the region traditionally consume an infusion of guayusa brewed from its leaves, and its extensive usage by humans throughout its range strongly suggests some degree of domestication. Guayusa belongs to the only extant genus of the family Aquifoliaceae that contains 600 species, of which ca. 300 species can be found in the Neotropics (Loizeau et al. 2005). Available literature and museum collections have registered guayusa at altitudes ranging from 200 to 2,600 m (Loizeau and Barriera 1999). Members of the *Ilex* genus exhibit low inter-specific floral, palynological, and anatomical variation as well as a tendency for hybridization (Manen et al. 2010). Nearly all records for guayusa are associated with current or abandoned cultivation sites.

Domesticated guayusa individuals can grow to an average of 10 m high and present a multitude of stems that measure 2 to 15 cm at breast height (Fig. 1). When mature and if unmanaged, guayusa individuals can reach a height of approximately 25 m and a stem diameter of approximately 50 cm at breast height. Guayusa is a dioecious species (Shemluck 1979). Despite the presence of seeds, guayusa is only known to reproduce asexually by human planting of the leafless hardwood stem cuttings extracted from the base of a stock plant. Like several other species within the genus, guayusa leaves have been found to contain alkaloids (e.g., caffeine and theobromine) (Radice and Vidari 2000).

In this paper we provide a summary of existing literature on guayusa, as well as ethnographic descriptions of its uses among contemporary human populations. Based on this information, we argue that *I. guayusa* should be considered a domesticated species (*sensu* Clement 1999) with a long history of human propagation and consumption. Consequently, we suggest lines of research needed to confirm this proposition.

### Materials and Methods

A review of archaeological and historical records of guayusa present in the literature and in museum collections was conducted. A map of the past and current distribution of guayusa was inferred from geo-referenced records present in the Tropicos database (Fig. 2, Tropicos.org 2013). Geographic coordinates were used to create a map of the probable natural range of *I. guayusa* using ArcMap software. The World Wildlife Fund (WWF) ecoregions dataset was used to overlay with the geographic coordinates for the samples (Olson et al. 2001).

Supporting literature on the ethnobotany of guayusa was also reviewed. Existing ethnobotanical information was supplemented with semi-structured interviews conducted between June 2010 and October 2013 in Ecuador (Napo Province), Colombia (Bogotá, Nariño, and Putumayo departments), and Peru (Amazonas, Cajamarca, and Piura departments). In Ecuador, indigenous Amazonian Kichwa speakers were interviewed (n=23). In Colombia, we interviewed market vendors (n=2) in Pasto, shopkeepers at



**Fig. 1.** Cultivated *Ilex guayusa* in Canton Archidona, Ecuador. Photo credit: Fundación Runa.

natural medicine and handicraft stores (n=4) in the Valle de Sibundoy, one conservation worker in the town of Colón, and one indigenous Inga healer in the town of Santiago. In Peru, interviews were conducted with landowners (n=40).

## Results

### ARCHAEOLOGY AND HISTORY OF GUAYUSA

Archaeological and historical records suggest that guayusa has been used and traded as a medicinal plant in the greater Andes–Amazon region since at least 500 C.E. Guayusa leaves dated to this time were found in a multi-family tomb in Niño Korin, Bautista Saavedra Province of Bolivia and were thought to belong to a “medicine man” of the Kallawayá (Tiwanaku) society (Wassén 1972). Guayusa also appears in numerous colonial accounts. Father Juan Lorenzo Lucero noted in 1682 that Jivaroan groups consumed *Banisteriopsis caapi* (a hallucinogenic vine known as *yagé* or *ayahuasca*), “guañusa,” and tobacco in infusions (Schultes 1979). In the 18th century, Father José Berrutieta, the head priest at Santa Rosa mission in Colombia, noted multiple beneficial health qualities of guayusa drink, including its use as a remedy for venereal diseases, “cleansing the blood,” improving digestion and appetite, and strengthening the body. He also observed that women drank guayusa with honey to increase fertility. The Jesuits also transported guayusa leaves from their missions and sold them as medicine in Quito, usually marketing them as a cure for sexually transmitted diseases

(Schultes 1979). Indeed, guayusa use appears to have declined significantly after the Jesuits were expelled in 1766 (Patiño 1968).

British botanist–explorer Richard Spruce made extensive reference to guayusa. He found guayusa grown by indigenous peoples near the “ancient site” of Antombós near the contemporary town of Baños in 1857 (Schultes 1979). Spruce also explained the common practice of daily purging with guayusa during the morning hours. In a similar account, Ecuadorian geographer Miguel Villavicencio (1858:373–374) described people using feathers to provoke vomiting after drinking large amounts of guayusa.

In addition to acknowledging the medicinal value of guayusa, historical records mention various aspects of its cultivation and storage. Father Serra planted guayusa using cuttings. Father Berrutieta stored guayusa leaves as bundles tied together by strings (Schultes 1979), a practice still common in Ecuador today. Spruce also noted that guayusa trees seemed to be cultivated near settlements, and “small clumps of it in the forest on the ascent of the Cordillera indicate deserted Indian sites” (Schultes 1979:144).

### ETHNOGRAPHIC USES OF GUAYUSA

#### *Ecuador*

Amazonian Kichwa people grow guayusa in their horticultural plots (*chakras*). A study of plant use among one Kichwa group found guayusa to be the most commonly mentioned plant species due to its

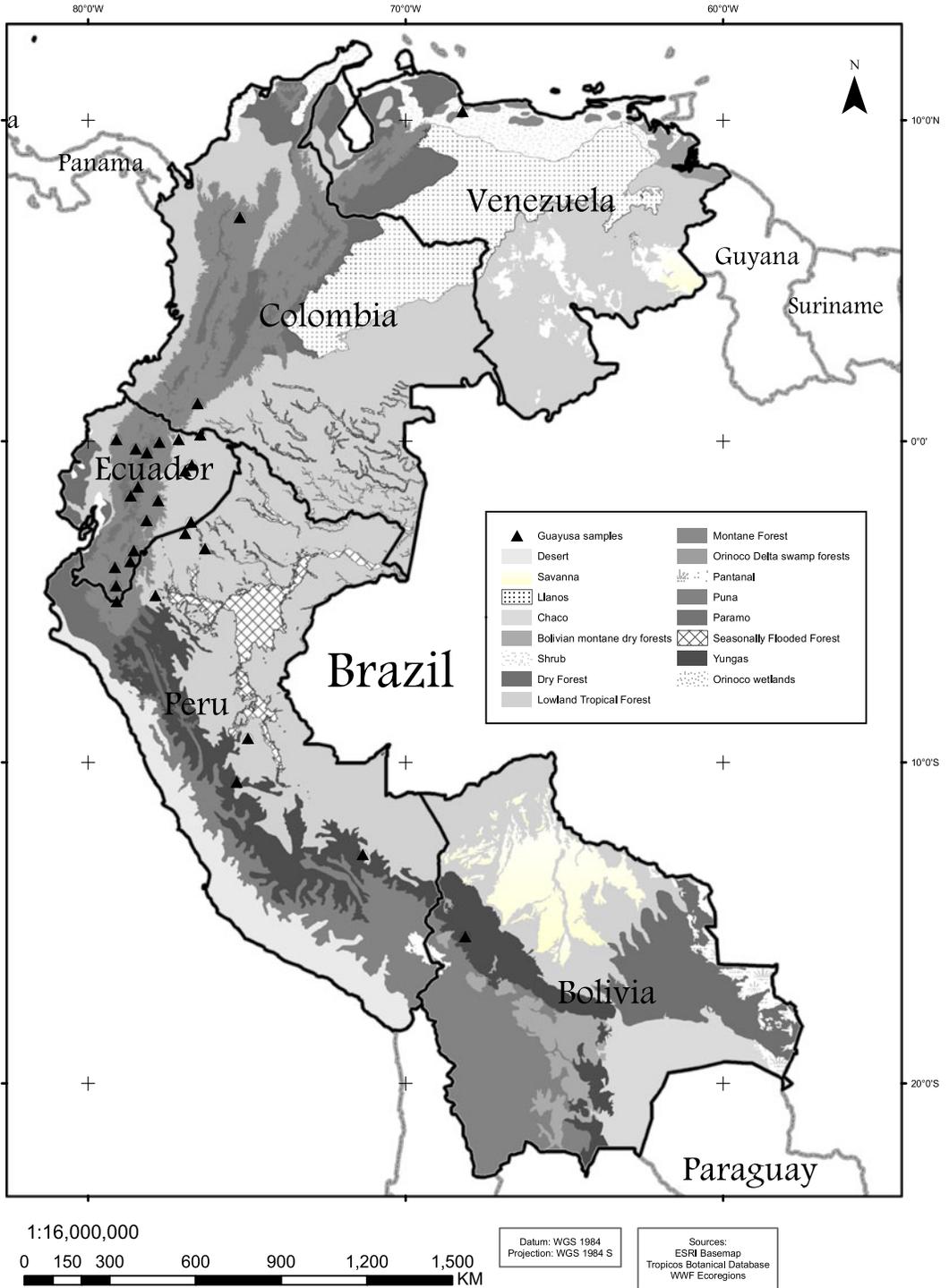


Fig. 2. A map of probable guayusa distribution in South America overlaid with WWF ecoregion layers.

ritual uses and medicinal properties (Innerhofer and Bernhardt 2011). Most Kichwa people have at least a few old trees near their homes for easy access to prepare daily infusions.

Many Kichwa people consume a tea-like beverage using guayusa leaves nearly every day. Guayusa drink consumption resembles that of yerba mate (*Ilex paraguariensis* A. St.-Hil.) in the southern regions of South America, although guayusa is boiled in a separate pot and only the water mixture is served, rather than being prepared in the gourd as is common with yerba mate. It is generally considered the responsibility of women, especially daughters-in-law, to prepare guayusa tea and serve gourds of it to family members and visitors. Among Kichwa people, guayusa drinking plays a central role in promoting everyday “conviviality” (*convivencia* in Spanish), which emphasizes informality, high affectivity, and close relationships among kin (Overing and Passes 2000). While drinking guayusa, some Kichwa adults weave fishing nets and traps and shoulder bags, play music, and tell stories. Some elder men and women also interpret dreams, and some Kichwa people say guayusa helps them to dream. During guayusa drinking, elders also give advice to young people and carry out “advising rituals,” or traditional punishments, which often involve putting capsicum juice in children’s eyes and shaking nettle branches over their bodies. These rituals are meant to reorient young people’s lives and strengthen their bodies.

During festivals, Kichwa people often organize guayusa-themed events. For example, the last evening dance of a community *fiesta* is often referred to as the “Gran Guayusazo Bailable” (Great Guayusa Dance Fest). For many *fiestas*, the popular beauty queen contests include an award for the “Guayusa Warmi” (Guayusa Woman). Finally, during one of the last mornings of *fiestas*, the newly elected beauty queen walks with a group of friends, family, and local political authorities, from house to house serving guayusa tea to community members. Often the beauty queen’s group is accompanied by Kichwa musicians, whose songs announce the group’s arrival before sunrise.

Kichwa people recognize a variety of useful qualities of guayusa leaves. While Kichwa use the infusion of leaves mainly as a stimulant, they also use guayusa as a stomach tonic, diuretic, and flu remedy, usually in some combination of ginger, lime juice, *chuchuwasu*, and/or sugar cane liquor. Guayusa is also believed to calm body aches, to

increase fertility and libido, to cleanse the mouth, and to avoid insect and snakebites. Many Kichwa people will spit small amounts of the tea on their arms and legs as a “repellent.” Many also use guayusa to rinse their mouths and wipe guayusa water on their arms, legs and face, which some suggest helps to keep skin from aging. Some Kichwa people bathe their children in warm guayusa water and prepare vapor baths using guayusa. Some also wash their dogs’ faces with guayusa tea, which they believe helps dogs to dream and become good hunters (Kohn 2007).

Guayusa is also found in Shuar and Achuar gardens in a very similar fashion to the Kichwas, that is, as a planted tree that is consumed in an informal morning setting for its medicinal and stimulating properties (Descola 1996:127–128). Although Achuar drink guayusa, they usually self-induce vomiting after their daily intake. For the Achuar, “it is unseemly for a man to start the day with a full stomach and the *wayus* helps him to cleanse his bowels” (Descola 1996:127). The emetic effect of guayusa is learned and does not appear to be due to compounds found in guayusa itself (Lewis et al. 1991). For the Shuar, drinking guayusa is not usually a daily affair. Guayusa also plays an important role in Jivaroan rituals. For example, during the “Jivaro Tobacco Ceremony of the Women,” women are required to cleanse their mouths by drinking and spitting out guayusa tea, and during the “Victory Festival and the Tsantsa Feast” the warrior and his wife and daughter must wash their mouths out before eating the ceremonial meal (Schultes 1972).

Although the Cofán and Secoya are familiar with guayusa, its use appears not to be as prevalent. Cofán people use guayusa occasionally as an additive to spirits during festivals while Secoya are reported to use guayusa tea to treat body pains (de la Torre et al. 2008). Highland Kichwa have adopted the use of guayusa as a medicinal beverage to treat several ailments but also as an additive to spirits. Among these people, guayusa is largely used to treat pain (de la Torre et al. 2008). Similarly, *Tsa’chi* people on the coast use it to treat menstrual cramps and relieve pain after childbirth, although the delivery method is in the form of steam baths (de la Torre et al. 2008).

Mestizo and white populations of highland Ecuador consume guayusa infusions as an additive to spirits. Guayusa leaves are sold in the form of tight necklaces in markets in the main Andean and Amazonian cities, or by vendors stretched along the

main highways that lead to the Amazonian regions. In Amazonian provinces mestizo settlers, known as *colonos*, brew guayusa, leave it to cool, and mix it with lemon juice and unrefined sugar. The drink is served cold during hot midday hours, similar to the yerba mate drink *tereré*.

### Colombia

As of August 2013, guayusa was available for purchase in the public herb market in Pasto. According to vendors, the leaves came from the Sibundoy Valley and other parts of Putumayo Department. In Pasto, guayusa is most often consumed in *peñas*—downtown bars where young people meet to drink and listen to Andean music. *Peñas* serve *hervidos*, hot cocktails made with sugar cane liquor, guayusa, and various mixtures of fruits and spices.

In the town of Sibundoy, guayusa was found for sale in a bottled sarsaparilla tonic called “The Bristol of Putumayo.” The leaves for the tonic were obtained from the lower Putumayo region, south of the town of Mocoa. Guayusa is also reported to exist in the Sibundoy Valley, at altitudes of up to 3,000 meters. One Inga healer in the town of Santiago claims to have guayusa, which she uses to facilitate post-partum uterine healing.

### Peru

While guayusa is consumed in Peru for its stimulating effects, most people report using it for its medicinal qualities. It is known to “clean blood” (to remove excess sugars from the blood), a remedy used to treat diabetes. It is also commonly used to cleanse the vagina after giving birth in order to reduce post-partum bleeding. Some people report making an alcoholic beverage with guayusa similar to what has been reported for the Ecuadorian and Colombian highlands.

The Awajún people of northern Peru, related to the Shuar and Achuar of Ecuador, use guayusa similarly to their relatives north of the border. Most of the *Ilex guayusa* found in Peru is said to come either from Ecuador or from the land of the Awajún (near the border with Ecuador) (Fernando Rubio, pers. comm.).

## Discussion

All available evidence suggests *I. guayusa* ought to be considered a cultivar. The age of the ancient

guayusa leaves found in Bolivia indicates the species has been used for at least 1,500 years. The existence of guayusa leaves far south of any contemporary botanical finds suggests the tree was likely cultivated or traded throughout a much larger range in the past, and that this range has potentially shrunk over the last millennium and a half (Schultes 1972). Historical accounts also reinforce the important role of humans in guayusa propagation. As written by Schultes (1979:49), “I find no evidence in the literature to suggest its occurrence in an undoubtedly wild state. All references indicate that guayusa, when not planted, grows as an escape or vestige of former plantings around abandoned human habitation sites.” Indeed, there are no confirmed discoveries of “wild” guayusa in the literature.

Analytical treatment of guayusa as a domesticated species fits with a growing literature on the important role of human societies in promoting species diversity in the Amazonian region (Balée 2013; Erickson 2010; Heckenberger et al. 2008; Rival 2006). While there is a considerable diversity of cultural practices and medicinal uses associated with guayusa among different ethnic groups, there seems to be extensive diffusion of these traditions across ethnic lines, which is consistent with prolonged trading practices.

While the close relationship of human societies with this species suggest a domesticated status, further research needs to be undertaken to understand guayusa’s role in diverse ecologies. In particular, fundamental ecological research to elucidate if guayusa can actually be found in the wild is a priority. For instance, phylogenetic and pharmacological studies of regional *Ilex* are crucial to shed light on guayusa’s status as a cultivar and to provide information important for its management. On the other hand, it is not known whether embryonic immaturity (Mroginski et al. 2011) and absence of specific pollinators as a

TABLE 1. SPECIES SOMETIMES REFERRED TO AS GUAYUSA IN THE LITERATURE.

Species name	Reference
<i>Ilex inudata</i>	de la Torre et al. 2008
<i>Pterocarpus robrii</i>	Cerón et al. 2012
<i>Tapura jurana</i>	Cerón et al. 2012
<i>Drypetes amazonica</i>	Cerón et al. 2012
<i>Dendropanax caucanus</i>	Cerón et al. 2012
<i>Piper</i> sp.	Kvist and Holm-Nielsen 1987

result of habitat modification (Lowe et al. 2005) might be affecting the onset of fertile seeds in *I. guayusa*. Alternatively, vegetative propagation could have evolved in this species to ensure reproduction in situations where out-crossing is not possible (Holsinger 2000). We propose that the tendency of guayusa for vegetative growth coupled by intermittent trading relationships between Amazonian groups might explain guayusa distribution.

In relation to the therapeutic uses of guayusa, we acknowledge that available museum records and accounts have not always been verified to ensure they actually refer to *I. guayusa*, or to a different species with similar uses (Table 1). Meanwhile, *I. guayusa's* stimulating and medicinal properties will continue to position it as a valued species of the Andean–Amazonian interface, especially given intensification of market-oriented guayusa production in recent years.

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### Literature Cited

- Balée, W. 2013. Cultural forests of the Amazon: A historical ecology of people and their landscapes. The University of Alabama Press, Tuscaloosa, Alabama.
- Cerón, C., C. I. Reyes, E. D. Jiménez, and D. J. Simba. 2012. Plántas útiles de los Kichwa del centro norte de la Amazonía Ecuatoriana. *Cinchona* 12:22–202.
- Clement, C. R. 1999. 1492 and the loss of Amazonian crop genetic resources. I. The relation between domestication and human population decline. *Economic Botany* 53(2):188–202.
- De la Torre, L., H. Navarrete, M. P. Muriel, M. J. Macía, and H. Balslev, eds. 2008. *Enciclopedia de las Plantas Útiles del Ecuador*. Herbario QCA and Herbario AAU, Quito and Aarhus.
- Descola, P. 1996. *In the society of nature: A native ecology in Amazonia*. Cambridge University Press, Cambridge, United Kingdom.
- Erickson, C. L. 2010. The transformation of environment into landscape: The historical ecology of monumental earthwork construction in the Bolivian Amazon. *Diversity* 2(4):618–652.
- Heckenberger, M. J., J. C. Russell, C. Fausto, J. R. Toney, M. J. Schmidt, E. Pereira, and A. Kuikuro. 2008. Pre-Columbian urbanism, anthropogenic landscapes, and the future of the Amazon. *Science* 321(5893):1214–1217.
- Holsinger, K. E. 2000. Reproductive systems and evolution in vascular plants. *Proceedings of the National Academy of Sciences* 97(13):7037–7042.
- Innerhofer, S. and K. G. Bernhardt. 2011. Ethnobotanic garden design in the Ecuadorian Amazon. *Biodiversity and Conservation* 20:429–439.
- Kohn, E. 2007. How dogs dream: Amazonian natures and the politics of transspecies engagement. *American Ethnologist* 34(1):3–24.
- Kvist, L. P. and L. B. Holm-Nielsen. 1987. Ethnobotanical aspects of lowland Ecuador. *Opera Botanica* 92:83–107.
- Lewis, W. H., E. J. Kennelly, G. N. Bass, H. J. Wedner, M. P. Elvin-Lewis, and D. Fast. 1991. Ritualistic use of the holly *Ilex guayusa* by Amazonian Jívaro Indians. *Journal of Ethnopharmacology* 33:25–30.
- Loizeau, P. A. and G. Barriera. 1999. Aquifoliaceae. Pages 225–227 in P. M. Jørgensen and S. León-Yáñez, eds., *Catalogue of the vascular plants of Ecuador*. Monographs in Systematic Botany of the Missouri Botanical Garden, Vol. 75. Missouri Botanical Garden, St. Louis, Missouri.
- , G. Barriera, J. F. Manen, and O. Broennimann. 2005. Towards an understanding of the distribution of *Ilex* L. (Aquifoliaceae) on a world-wide scale. *Biologiske Skrifter* 55:501–520.
- Lowe, A. J., D. Boshier, M. Ward, C. F. E. Bacles, and C. Navarro. 2005. Genetic resource impacts

- of habitat loss and degradation; reconciling empirical evidence and predicted theory for neotropical trees. *Heredity* 95(4):255–73.
- Manen, J. F., G. Barrera, P. A. Loizeau, and Y. Naciri. 2010. The history of extant *Ilex* species (Aquifoliaceae): Evidence of hybridization within a Miocene radiation. *Molecular Phylogenetics and Evolution* 57(3):961–977.
- Mroginski, L., N. Dolce, P. Sansberro, C. Luna, A. Gonzalez, and H. Rey. 2011. Cryopreservation of *Ilex* immature zygotic embryos. Pages 215–225 in T. A. Thorpe and E. C. Yeung, eds., *Plant embryo culture: Methods and protocols*, Vol. 710. Humana Press, New York.
- Olson, D. M., E. Dinerstein, E. D. Wikramanayake, N. D. Burgess, G. V. N. Powell, E. C. Underwood, and J. A. D'amico. 2001. Terrestrial ecoregions of the world: A new map of life on earth a new global map of terrestrial ecoregions provides an innovative tool for conserving biodiversity. *BioScience* 51(11):933–38.
- Overing, J. and A. Passes. 2000. *The anthropology of love and anger: The aesthetics of conviviality in native Amazonia*. Psychology Press, London.
- Patíño, V. M. 1968. Guayusa, a neglected stimulant from the eastern Andean foothills. *Economic Botany* 22(4):310–316.
- Radice, M. and G. Vidari. 2000. Caracterización fitoquímica de la especie *Ilex guayusa* Loes. y elaboración de un prototipo de fitofármaco de interés comercial. *La Granja* 6:3–11.
- Rival, L. 2006. Amazonian historical ecologies. *The Journal of the Royal Anthropological Institute* 12:S79–S94.
- Schultes, R. E. 1972. *Ilex guayusa* from 500 A.D. to the present. Pages 115–138 in S. H. Wassén, ed., *Etnologiska studier*. Botanical Museum at Harvard University, Cambridge, Massachusetts.
- . 1979. Discovery of an ancient guayusa plantation in Colombia. *Botanical Museum Leaflets, Harvard University* 27(5–6):143–153.
- Shemluck, M. 1979. The flowers of *Ilex guayusa*. *Botanical Museum Leaflets, Harvard University* 27(5–6):155–160.
- Tropicos.org. 2013. Missouri Botanical Garden. <http://www.tropicos.org/Name/2000086> (27 Nov 2013).
- Villavicencio, M. 1858. *Geografía de la República del Ecuador*. Ferdinand Mayer and Co., New York.
- Wassén, S. H., ed. 1972. A medicine-man's implements and plants in a Tihuanacoid tomb in highland Bolivia. *Etnologiska studier*, Vol. 32. Göteborg, Sweden: Göteborg Etnografiska Museum.