

MAIN SACRED PLANTS IN SOUTH AMERICA

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*“Visionary plant products and potions
which modify at will the state of mind
are considered sacred
and are used to improve people’s health,
to enter magic dimensions of their reality,
or to knit more tightly the society that they are part of.”*

Josep Fericgla. *Los jíbaros, cazadores de sueños*
(*The Jivaro, Dream Hunters*).

I. Introduction

The use of native mighty plants for the purposes of diagnosis and cure of illnesses, as well as for the communication with supernatural dimensions, is now and has been for ages a fundamental shamanic resource in the Americas.

Although specific to each area and culture, shamanic knowledge exists in almost every region of the continent and it goes back thousands of years. To bear witness to the temporal depth of this wisdom, it will suffice to mention two examples, one from the Amazon area and the other from the Andean area. Recent research points out that ayahuasca (*Banisteriopsis caapi*), one of the most important *sacred plants* of the Amazon rain forest, has been used by indigenous peoples for no less than five thousand years (Schultes 1972:38-39; Naranjo, P. 1986:117-127; Fericgla 1997:29). Likewise, the archaeological use of cebil (*Anadenanthera colubrina var. cebil*) in the Southern Andes from as early as 2130 BC up to the period that followed the Spanish conquest has been widely documented (Fernandez Distel 1980, 1982; Pérez Gollán and Gordillo 1993, 1994, Torres & Repke 2006)).

Such plants, which in the West have received diverse and contrasting denominations and approaches, are *sacred* to the indigenous peoples. We therefore consider it appropriate to adopt as general labels the expression *sacred plants* and alternatively the neologism of similar meaning *entheogens*, coined a few decades ago by several authors (Ruck et.al. 1979), instead of other designations –such as *psychoactive*, *psychotropic*, or *psychedelic*– which describe more precisely the effects of the plant but, being more technical, lack the spiritual dimension that this phenomenon implies.

Even though the main purpose of this work is to present an orderly synthesis of botanical, chemical and cultural information on the plants that we have selected as main *sacred plants* used by South American shamanic traditions, we also think it is worth to devote some paragraphs in this introduction to revise a number of terminology issues. Above all, it is necessary to question and even reject the use in this context of a still widespread expression, at least in Argentina, the term *hallucinogen*. This word, heavily loaded with negative, pathological and ethnocentric connotations, relates dangerously these plants with the western idea of "drugs." Even though many different elements clearly distinguish *sacred plants* from those substances that provoke drug addiction, this is a delicate ground where confusion is likely to arise.

The term *hallucinogen* comes from the fields of toxicology and psychiatry. It appears to have been first used in print in 1953 by an English physician, Christopher Johnson, who in turn may have borrowed the word from three other doctors: Humphry Osmond, John Smythies and Abram

Hoffer. The title of the work was precisely *The Hallucinogenic Drugs*. And the term *hallucinogen* was applied to *psychoactive* substances –considered drugs ever since– whose effects are similar to those typical of certain mental illnesses or disorders, which make one believe that one sees, hears or feels things that arise from no “real” external sensorial stimulus but which are distorted fabrications of one’s own mind. The word hallucination is analogous to delirium; to hallucinate is to perceive inexistent things. And those who hallucinate are considered distraught or insane. Ruck, Wasson and other authors argue:

The verb ‘hallucinate,’ however, immediately imposes a value judgment upon the nature of the altered perceptions, for it means to be deceived or entertain false notions. It comes from the Latin *(h)al(l)ucinari*, ‘to wander mentally or talk nonsensically,’ and is synonymous with verbs meaning to be delirious or insane. It appears, moreover, to have been borrowed from the Greek, where it is related to a group of words that imply restless movement and perplexed excitement, such as that caused by grief and despair. How can such a term allow one to discuss without bias those transcendent and beatific states of communion with deity that numerous peoples believe they or their shamans attain through the ingestion of what we now call ‘hallucinogens?’

Ruck et.al. quoted by Wasson et al. 1995:232 (*)¹

Even stronger than this association of the term with a pathological state is the implied condemnation –typical of western rationality and most especially scientificistic rationality– of any state of consciousness which differs from that of ordinary reality or perception. If we take the discussion to an ontological scale, we can see that the use of word *hallucinogen* to describe the means that allow a direct experience of the divine, or at least to reach different levels of consciousness, not only questions but also denies from the start the legitimacy of the very existence of non-ordinary dimensions of reality. This apparently “technical” designation conceals logocentric positions and attitudes which have served as atrocious instruments of social control and discrimination.

For all these reasons, we reject the application of the term *hallucinogens* to *sacred plants*, above all, as we take into account that its use has proliferated indiscriminately in the specialized literature.

Many authors make a profuse and uncritical use of such word, even those who have been clearly aware of the specificity of these vegetal species as well as of their spiritual significance. Such is the case of Albert Hofmann, discoverer of LSD and co-author of one of the capital works of modern ethnobotany –paradoxically entitled *Plants of the Gods. Origins of Hallucinogenic Use*. He states that “Plants that alter the functions of the mind and body have always been considered by peoples in non-industrial societies as sacred, and the hallucinogens have been ‘plants of the gods’ par

¹ In references marked (*), the numbers of pages shown belong to the Spanish editions from which the quotations were taken for the original version of this article, published in Llamazares & Martínez Sarasola (Eds) 2004.

excellence” (Schultes and Hofmann 1979:7). This author also defined this kind of substances as follows:

Hallucinogens distinguish themselves from all other psychoactive substances through their extremely profound effects upon the human psyche. They bring about radical psychological changes which are associated with altered experiences of space and time, the most basic categories of human existence. Even the consciousness of one’s own corporeality and one’s own self may be changed dramatically. Hallucinogens take us to another world, to a type of dream world which is nevertheless experienced as completely real (...) At the same time, if the dosage is not too high, consciousness and memory are retained completely. This is a key distinction between these substances and the opiates and other intoxicants, whose effects are associated with an obscuration of consciousness.

Unpublished lecture by A. Hofmann quoted in Rudgley 1998:126-127.

Another denomination gained popularity during the sixties and seventies along with “counter-culture” and the hippie movement: the term ‘*psychedelic*’. Well-intentioned in its origin, this word was soon brought into discredit due to the excesses of those social movements that came to be associated with it. *Psychedelic* was coined by the English psychiatrist Humphry Osmond, mentioned above. In the fifties, after settling in Canada, Osmond began to experiment with LSD as he tried to develop a treatment to help patients recover from alcoholism; thus he became an assiduous researcher into the effects of the newly discovered substance. Among other experiences, Osmond gave mescaline to Aldous Huxley, the famous English writer and philosopher, who voluntarily entered the world of extended states of consciousness. In an epistolary exchange that they maintained during 1956 seeking a proper way to designate mescaline, Huxley proposed the following rhyme: “To make this trivial world sublime/take a half a gramme of phanerotype,” the latter term derived from a Greek expression whose approximate meaning is “revealer or discloser of the soul.” Perhaps because of its oddity, this word did not succeed at all but the term used in Osmond’s reply became very popular: “To fathom Hell or soar angelic / Just take a pinch of psychedelic.”²

One of the most recent advocates of this word is the psychologist Richard Yensen, who even revalues it by proposing the creation of a new inter-disciplinary field called *psychedelic* medicine. He holds that “(...) etymologically, it remains a spiritual term, deep and suitable for a family of compounds which open the mind to an experience that transcends the space-time boundaries of the ego” (Yensen 1998:26).³ It is almost impossible, however, to deny the immediate association of the term with the movement

² Quoted in: Rudgley 1998:210.

³ According to the *Oxford English Dictionary*, *psyche* is “the principle that drives the human being and other living beings, the source of all vital activity, rational or irrational, the soul or spirit, which is distinguished from the material vehicle.” The ending *-delic* also has its origin in the Greek *deloun*, which means “reveal, make manifest or visible.” (Quoted in Yensen 1998:26).*

that was even named after it –the *sixties psychedelia*. In those times, *psychedelic* substances were used in an unbridled way, utterly devoid of any sacred sense, without consideration of the chemical or vegetal nature of the substances, or their original ritual contexts in indigenous traditions. All of this, together with the ghastly consequences suffered by many of those who joined the craze, disqualifies the term –from our point of view– as an adequate designation for sacred plants or their shamanic use.

Due to this background of terminological difficulties, some authors later believed that it was necessary to coin still another neologism which could better convey the more meaningful role of these plants and substances, that is, to make it possible to have the inner experience of the divine in oneself. Thus, in a now classic article published in 1979,⁴ Gordon Wasson – the “magic” mushrooms renowned researcher– and his collaborators, Carl Ruck, Jeremy Bigwood, Dany Staples and Johnattan Ott proposed to replace the terms *hallucinogen* and *psychedelic* with *entheogen*, which etimologically means “that which generates God within ourselves.”

In Greek the word *entheos* means literally “god (*theos*) within”, and was used to describe the condition that follows when one is inspired and possessed by the god that has entered one's body. It was applied to prophetic seizures, erotic passion and artistic creation, as well as to those religious rites in which mystical states were experienced through the ingestion of substances that were transubstantial with the deity. In combination with the Greek root *gen-*, which denotes the action of “becoming,” this word results in the term that we are proposing: *entheogen*.

Ruck et.al. 1979:145-156.

This new denomination has gradually gained more and more support. It is used nowadays by many authors and in different languages; moreover, a word derived from it –*entheobotany*– is now applied to designate a specific field of study. Nevertheless, some of the creators of the term *entheogen* have admitted the limitation that, even if the problem of finding a culturally fit and non-derogatory term has been elegantly solved, this term does not permit to identify the pharmacological properties of the plant or substance in question. Furthermore, its chemical classification is not simple or univocal, since these species contain different types of alkaloids and amino acids in their structures. Therefore, for the sake of precision, we have no alternative but to use a compound phrase in which the latter element describes the kind of effect that the plant produces (Ott 1995).

Therefore, among all the terminology currently used, the word *entheogen* and its derivatives seem to us the most acceptable to refer to the cultural use of substances –whether vegetal or synthetic– that produce amplified states of consciousness. Personally, we have chosen the phrase *sacred plants* since we find it broader in its theoretical extension and, at the same time, closer to the meaning that these vegetal species have to the indigenous peoples themselves.

⁴ Ruck C. et al. *Entheogens*. *Journal of Psychedelic Research* 11(1-2) 145-146.

The indigenous conception makes a distinction between exclusively medicinal plants and *sacred plants*. While the former contain healing properties, the latter contain, along with those properties, the possibility of provoking in the person who takes them a state of extended consciousness comparable to an ecstatic seizure which modifies perception; and by means of bodily or auditory sensations, visions or insights, it is possible to come into contact with supernatural dimensions or entities. Such passages or shifts in consciousness have a curative effect in themselves, beyond the specific operations that the shaman may in turn perform. In traditional indigenous contexts, it is inconceivable to use *sacred plants* for frivolous purposes, merely for entertainment or as a temporary escape. Their knowledge is passed down with the secrecy that protects highly restricted wisdom. These plants are prepared and taken only under of strict norms and in a framework of ceremonies or rituals, usually conducted by a shaman or person of wisdom.

From this point of view, it is also important that the way we refer to these plants is consistent with the designations that other authors have adopted to name this field of study, which certainly crosses traditional disciplinary borders and encompasses a global and comprehensive approach to the phenomenon of multiple dimensions of the human psyche.

In the framework of western science based on new paradigms such as Karl Pribram's brain model and David Bohm's physics theory of holomovement, psychology has also expanded its boundaries to include the whole range of experiences that go beyond the everyday consciousness of ego. Within this new transpersonal approach to psychology, psychiatrist Stanislav Grof has coined the term *holotropic* for a kind of therapy that integrates breathing techniques, evocative music and other forms of sound and body work, which allow access to states of consciousness similar to those traditionally achieved by means of *entheogenic* plants or substances. This term derives from the Greek *holos* (wholeness) and *tropos* (movement or tendency). Grof's psychology understands that the human being is a particle of the universe and contains it holographically within, tending permanently toward Wholeness. All *holotropic* experience is therefore therapeutic, as it brings us closer to integration with Wholeness.⁵

In addition, seeking to express the creative potential of such states of consciousness, anthropologist Josep Fericgla has coined a very similar term: the *holorenic consciousness* state. Also inspired in the Greek *eurisko*, meaning to invent, find or discover, *holorenic consciousness* can be described as "the level of mental processing which entails creation, and the act of discovering the wholeness of the universe." According to Fericgla:

The expressive mode or style is the mythopoietic mode, through which an holorenic state of the mind is made manifest (...) which occurs when one is

⁵ We have not included references to the extensive literature available on this subject because it does not correspond exactly to topic of this article. We shall only mention here a few major works such as such as Charles Tart's *Transpersonal Psychologies* (1975), and Stanislav Grof's *Beyond the Brain* (1985), *The Holotropic Mind* (1992) or *Psychology of the Future* (2000).

in an attitude of grasping the ineffable that is generated by our mind and conveying it to the 'objective' world, when one is or expects to be inspired.

Fericgla 1989:23

Both terms –*holotropic* and *holorenic* are very consistent with each other and express the same need to give new names, more suitable and expressive, to a whole field of phenomena that proves increasingly broader and more complex. In particular, a still scarcely explored ground is the discovery of the properties of sacred plants as well as the special relationship that the indigenous peoples have had for centuries and continue to have with them, as “masters” and “doors” to knowledge.

Different disciplines including anthropology, psychology, medicine, ethnobotany, biology and chemistry have been seriously and systematically studying the importance of these plants. For about thirty years now, scientific interest has been joined by an attitude of reevaluation of the age-old wisdom of indigenous peoples and an effort to integrate this knowledge with western knowledge. In certain aspects, new western holistic science finds coincidences with indigenous conceptions, for instance, in relation to the concepts of health and illness, as a dynamic unity of the physical, the emotional and the spiritual. The convergence of these conceptions expands the frontiers of knowledge, as it permits a more comprehensive and integral vision of the human beings and their possibilities.⁶

This article aims to compensate for a shortage of literature by collecting anthropological and botanic information on the main *sacred plants* used by the indigenous shamanic traditions of South America. We have selected the following nine vegetal genera and some of their respective species: *Anadenanthera* (cebil), *Banisteriopsis* (ayahuasca), *Brugmansia* (floripondio or angel's trumpet), *Datura* (chamico or Jimson weed), *Drymis* (canelo), *Erythroxylum* (coca), *Nicotiana* (tobacco), *Trichocereus* (San Pedro and Wachuma) and *Virola* (epena). The information is presented alphabetically, both in the following text and the final chart. We have also included a map that shows the approximate distribution of the species according to geographical and cultural criteria. We have used a large number of bibliographic sources, which are cited in the bibliography section, as well as our own unpublished data, collected in the framework of the research project *Ethno-medicine and Shamanism in South America*. This project was carried out from 1996 to 1999 by the *Fundación desdeAmérica*. Finally, it is worth to point out that, as an introductory synthesis, this article only aims to bring together and organize the relevant information

⁶ World level meetings such as the Rio Summit of 1992 have also contributed to legitimize indigenous knowledge of and about these plants, both *entheogenic* and medicinal, as well as the need to preserve tropical forests as the specific environment and repository of this wisdom.

scattered in very diverse sources, as well as to draw attention toward the fact that the southern part of our continent is home to an important concentration of *sacred plants*.

II. Main Sacred Plants Used by the Indigenous Peoples of South America Listed by Genus

1) Genus: ANADENANTHERA (2*)

Family: Leguminosae

* Indicates the number of known species.

This genus is native to the Neo-tropic and includes two species with one psychoactive variety each. It consists of trees and shrubs that inhabit the savanna and gallery forests; they also penetrate mountainous areas up to heights of 2100m above sea level.

a) *A. peregrina* (L.) Speg.

A. peregrina (L.) Speg. Var. *Falcata* (Benth.) Altschul.

Common names: yopo, yupa, niopo, hisioma, paricá, angico, cohoba,

Geographic distribution: They grow in tropical zones of Northern South America (the Orinoco Basin of Colombia and Venezuela, Southern British Guyana and the area of the Branco River, Brazil). The *falcata* variety is found in Southern Brazil and Paraguay (Altschul von Reis 1964).

Form of life: Tree

Components: Triptaminic derivatives (MMT, 5-MeO-MMT, DMT, 5-MeO-DMT) and betacarboxyls (6-MeO-MTHC, 6-MeO-DMTHC) among others

Types and modes of use by different indigenous groups:

Preparation of a psychoactive “rapé” (powder) from its seeds:

- In the Orinoco Basin it is known as “yopo” (Cuiva Indians of Venezuela).
- In the Western Indies it was known as “cohoba” but its use is no longer common.
- The Muro Indians and other ethnic groups of the Brazilian region of Madeira also use it as enema. It is known under the name “paricá” (de Smet 1983).
- Indigenous groups of British Guyana called it “paricá” or “paricama.” They burned the seeds and inhaled the smoke (Schomburgk 1848).
- The Guahibo of Orinoco take this powder daily as a stimulant, but it is more commonly used by healers to communicate with spirits or to prophesy; also for divination, to protect the community from epidemics and illnesses, and to help both hunters and their dogs to be more alert.

Antiquity: Their domestication and exchange seem to have originated in the Orinoco Basin. There is some evidence that the Chibcha communities of the Colombian Andes and of the plains of the Upper Orinoco used this powder in pre-Hispanic times. Its use among the indigenous populations of the Antilles is mentioned in texts of Christopher Columbus and Bartolomé de las Casas (fifteenth century).

b) *A. colubrina* (Vell.) Brenan

A.colubrina (Vell.) Brenan var. *cebil* (Griseb.) von Reis Altschul.

Common names: cebil, sebil, huilca, vilca, willka, vilgo, jataj, hatax, huayo, paricá, angico, pazco.

Form of life: Tree

Geographical distribution: They inhabit territories of Peru, Bolivia, Brazil, Paraguay and Argentina (Altschul von Reis 1964).

Components: Triptaminic derivatives (MMT, 5-MeO-MMT, DMT, 5-MeO-DMT) and betacarboxyls (6-MeO, MthC, 6-MeO-DMTHC) among others.

Types and modes of use by different indigenous groups:

Psychoactive “rapé” (powder):

- Shamanic use among the Wichí groups of Argentinian Chaco (Arenas 1992). Crushed seeds are smoked in a pipe, a “rapé” (powder) from its seeds is inhaled, and there is some information about its use in enemas. It is known as “jataj” or “hatax”.
- Some indigenous groups of Northern Argentina mix cebil with tobacco and smoke it (Califano 1975).
- Indigenous groups of Paraguay used to inhale the smoke of the roasted seeds (Dobrizhoffer 1822).
- Mashcos Indians of Paraguay
- In the central-southern Andes (Central and Southern Peru, Bolivia, Northern Chile and Northwestern Argentina) the nasal inhalation of the powder was common as well as its inclusion in beverages for religious, ritual or shamanic purposes. It was also smoked alone or mixed with tobacco in a pipe.
- We are presently investigating its use among the Chiriguano groups in Salta.

Antiquity: It has been used since pre-Hispanic times by indigenous Andean groups. The oldest archaeological finds belong to Inca Cueva, Jujuy, Argentina. Tubular bone pipes with coal containing NNDT, dated from 2130 BC (Fernández Distel 1980). Inhalatory tubes and tablets for the grinding of the seeds from 1200 BC were found in the Huaca Prieta and the Asia cultures of the Peruvian coast.

There have been abundant finds of inhalatory tubes and paraphernalia associated with “Tiwanaku”-style iconography in the circum-Titicaca-area since the early times of the Pucara culture (300 BC. – 100 AD). Its use continued until the Spanish Conquest. Numerous references to the plants’ use were found in the texts and chronicles of this period. A report states, for example, that in 1571 the Inca healers drank a beverage called *chicha*, fortified with *villca*, while prophesying.

2) Genus BANISTERIOPSIS (120)

Family: Malpighiaceae

- a) *B. caapi* (Spruce ex Griseb) C.V. Morton
- b) *B. inebrians* C.V. Morton
- c) *B. rusbyana* (Ndz.) Morton

Common names: ayahuasca (Peru), soga del muerto (Rope of the dead), caapi (Brazil), yagé (Colombia), enredadera del alma (creeper of the soul), dápa, mihi, kahi, natema, pindé.

Form of life: Vine

Geographical distribution: It is distributed throughout the Amazon Basin, including Western Brazil, Northeastern Peru, Colombia and Ecuador.

Components: Triptaminic derivatives and betacarbolinics (Harmine, Harmaline, Tetrahydroharmine, and harmol).

The sp. *B. rusbyana* is used as an additive, not as a principal component.

Types and modes of use by different indigenous groups:

- They make a beverage with the bark of either *B. caapi* or *B. Inebrians*, prepared in cold water or through a prolonged ebullition. It can be consumed plain, but frequently various plants are added, especially the leaves of *B. rusbyana*, known as *ocoyaje*, and those of *Psicotria viridis* (chacrana), in order to modify its visionary effects. The beverage is consumed by shamans for curation, divination, witchcraft and other purposes. Patients and people who want to amplify their personal consciousness can also take it.
- It is used in a ceremonial form in the Western half of the Amazonian Valley and by isolated ethnic groups of the Pacific slopes of the Andes, and in Colombia, Ecuador and Peru.
- Pano groups (Peruvian Amazon) and Culina use it for shamanic purposes, such as the treatment of illnesses by divination. In some communities, its use is not restricted to the shaman; however, women never take it.
- Other ethnic groups that consume this beverage are the Tucano (Colombia and Brazil), Yekwana, Kofan (Colombia), Campa and Shipibo-conibo (Peru), Záparo (Ecuador).
- The Jívaro think that ayahuasca makes it possible to communicate with their ancestors.
- It is a beverage used in religious ceremonies like the *tukanoan Yurupari* in Colombia, an initiation rite at the start of boy's adolescence.
- Indigenous people of the Upper Orinoco used to chew its bark (Spruce 1908; Roth 1924)
- In the Northwestern Amazonia, indigenous communities consume it as a "rapé" (powder).

Antiquity: Its use is so deep-rooted in the native philosophy and mythology that there is no doubt about its great antiquity, as a part of aboriginal life. Archaeological finds in Ecuador show that the indigenous Amazons have been using it for about 5000 years (Naranjo, P. 1986, Schultes 1972, Fericgla 1997).

3) Genus BRUGMANSIA (9)

Family: Solanaceae

- a) *B. sauveolens* (H. et B.) Bercht et Prest.
- b) *B. insignis* L.
- c) *B. aurea* Lagerh.
- d) *B. arborea* L.Lagerh.
- e) *B. vulcaniloca* (A.S. Barclay) R.E. Schult.
- f) *B. sanguinea* (R. et P.) Don
- g) *B. versicolor* Lagerh.

Common names: toá or toé, floripondio, borrachero, huacacachu, huaca huanto, maicoa, tonga (f), misha toro, campachu.

Form of life: Trees and perennial shrubs. White and pink flowers, strongly perfumed.

Geographical distribution: The species of the Brugmansia genus is native to South America. *B. sauveolens* and *B. insignis* are distributed in the warmer zones of South America, especially in the Western Amazon where they are used plain or mixed with other plants, commonly known as *toé*. Most of these plants live in moderate and humid mountainous regions, at altitudes surpassing 1830m. *B. aurea* is the most widely spread species and can be found in the Andes. *B. arborea*, *B. aurea* and *B. sanguinea* grow at heights of 1800m.

Components: Scopolamine, topane-type alkaloids, husocamine, atropine.

Types and modes of use by different indigenous groups:

- Various forms of use among the Peruvian healers: a) drinking the infusion or the alcoholic extract of the leaves and flowers, b) inhaling of the preparation, c) the leaves are directly applied on swollen skin or an aching part of the body, d) crushed seeds are mixed in a fermented beverage. The two forms mentioned first are used for shamanic purposes, for divination and witchcraft. They also make it possible to communicate with ancestors and reveal which tombs hold treasures. *B. sanguinea* is known as “*huacacahu*” and “*huaca*” which mean “sacred place” or “shrine.”
- The indigenous peoples of the western Amazon use it alone for visionary purposes or mixed with ayahuasca.
- The Mapuche in Chile use it as a remedy to calm restless children.
- The Jivaro used to give infusions of *B. sanguinea* to children who were difficult to handle.
- The Chibcha in Colombia prepared a fermented liquor to which they added seeds of this species, to give to the slaves and the wives of the dead chief; this made them fall into a state of stupor before they were buried alive with the corpse.
- The Chocó used the seeds to prepare magic liquor.
- The Ingano and Kamsá Indians of the Colombian Andes have a great knowledge of the psychoactive use of this species.

- The priests of the Sun Temple in Sagamosa, Colombia, considered tonga (*B. Sanguinea*) a sacred plant.
- The Guambianos of Southern Colombia use the species *B. Vulcanicola*.

Antiquity: The use of Brugmansia is very old. Representations of sorcerers with fruits of the “misha toro” appear in Peruvian pottery of the Nazca culture (300 BC–700 AD). Vessels with the conical shape of floripondio were molded in the Chavín culture (600 BC– 300 BC). There also exist representations of pink trumpet-shaped flowers in Inca “keros” (15th century AD).

4) Genus DATURA (15 sspp.)

Family: Solanaceae

Datura stramonium L.

Common names: Chamico, estramonio, chamisco, miyaya, miaia, hierba inca, higuera loca, manzana del diablo, trompeta del diablo, Jimson weed, toloache, ñongué, papa espinosa, manzana loca.

Geographical distribution: The *Datura* genus includes approximately 15 subspecies, which are distributed in moderate zones all over the world. Best-known is *D. Stramonium* which has the highest commercial value for medical uses as it has the highest concentration of alkaloids and is most easily cultivated. From Peru, it has been distributed all over the world. Its preferred habitats are coastal valleys although one can also find it in the mountains and the jungle.

Form of life: Annual herb. White and bluish slightly-scented flowers. The leaves are big and give out an unpleasant smell. The fruit is a rounded capsule with thorns.

Components: Atropine, scopolamine, hyscyamina.

Types and modes of use by different indigenous groups:

- In traditional Peruvian herbal medicine it is used in different ways: a) the smoke of the leaves, b) an infusion of the leaves and/or seeds, c) external application of the leaves. For medical purposes it is used to treat diarrhea, asthma attacks and vomit, among others. Shamans consume it as a beverage for divination and witchcraft. It is said of those who have become victims of involuntary subjection, that they were “enchamicados”.
- The miyaya or chamico was also a very important plant for the Mapuche. They used it for medical purposes and as a poison. (Hoffmann et.al.1992).

Antiquity: Known and used by the indigenous Peruvians since pre-Hispanic times, perhaps since the Nazca culture (300 BC – 700 AD). The first Spanish naturalists during the Conquest considered it a new plant. Father Cobo mentioned its use by indigenous “herbolarios” (herb healers) for narcotic and magical purposes (subjection of will). According to Stafford (1922) and Wein (1932) the “estramonio” was taken from Mexico to Spain in 1577 and then introduced in the rest of Europe.

5) Genus DRYMIS

Family Winteraceae

Drymis winterii Forst.

Common names: voigue, foique, foye, canelo.

Geographical Distribution: The genus *Drymis* is found on the American continent, the Island Juan Fernandez, Australia and New Zealand. In Chile it grows from Coquimbo to Cabo de Hornos, it is also found in the Argentinian Patagonia, preferring humid and marshy territories.

Form of life: Tree or shrub

Components: Vitamin C, essential oils, tannins, various herpenoids and flavonoids (Montes and Wilkomirsky 1985, Ubilla 1969). No psychoactive components have been found.

Types and modes of use by different indigenous groups:

- It is the principal sacred tree of the Araucanian culture, a symbol for benevolence, peace and justice. It is planted in all the places designated for social and religious meetings. The “machis” (female shamans) always have one of these trees in front of their “rucas” (houses); it is also present in religious or political ceremonies, so that the machis can receive its sacred inspiration. They rub themselves with the leaves’ juice before climbing up the sacred tree, and often drink the decoction prepared from its bark, which apparently produces intoxication and hallucinations (-sic-Santa Cruz 1937).
- Its medical uses were very ample, in its practical application as well as in its symbolic significance, which transcended the medical-shamanic ambit (Hoffmann et al.1992).
- Its bark, which unquestionably possesses tonic and stimulating qualities, is one of the most famous and mostly applied panaceas of the “machi,” the Araucanian healers.

6) Genus ERYTroxYLUM (250 varieties in South America and in Madagascar)

Family: Erytroxilaceae

a) *Erytroxylum coca* Lam.

E. Coca var coca (Bolivian coca or Huanuco coca: it is distributed in tropical humid valleys of the Eastern Andes from Ecuador to Southern Bolivia).

E. coca var ipadu (Cultivated in many parts of the Amazon Basin).

b) *Erytroxylum novogratense*

E. novogratense var. novogratense (Colombian coca: cultivated in the dry regions of Colombia and Venezuela).

E. novograntense var truxilense (Trujillo coca: cultivated in the dry valleys of Marañon and at the desert coast of Northern Peru).

Common names: coca, cuca, mamacoca, cocamama, coca of Peru.

Geographical distribution: Coca is native to Peru and Bolivia, it grows in the cordillera between heights of 600m and 2100m above sea level, but it can also be found in other South- and Central-American areas (Hoffmann et al. 1992). It is cultivated extensively in Eastern Peru and Bolivia in warm and humid valleys in the mountains. It is less extensively cultivated in Northern Chile, Ecuador, Southern Colombia and in the Sierra Nevada of Santa Marta in the Amazon Basin. Because of the presence of wild species in the mountainous region of Peru and Bolivia, the species cultivated today is thought to have originated in this area. (Martin 1970).

Form of life: Shrub

Components: 14 alkaloids pertaining to the tropanic series (ecgonines, tropines, and hygrines). It is a mixture of econines (cocaine, metilecgonina and cinamilcocaine), troeines (tropeine, pseudotropine, dihidroxipeina, tropacocaine and benzoiltrapone) and hingrines (hingrine, higroline and cuscohigrine).

Types and modes of use by different indigenous groups:

- The Quechua Indians considered it a sacred plant and used it as a gift for the Pacha Mama to secure a good harvest, before placing the cornerstones in the construction of a house and in religious rituals.
- Among the Colombian Chibchas it was used by the priests for divinatory purposes.
- The Bolivian Aymara chewed coca at all ceremonial occasions such as weddings or births. It is also used for divinatory purposes, by seers (yatiri), those who practice black magic (laiqua), those who practice white magic (paqo) and by healers (qolasiri).
- The Kogi Indians of the Sierra Nevada of Santa Maria use coca for religious purposes but its use is restricted to men.
- In the Andes it has been used to reduce fatigue and hunger in workers. The Incas gave it to the "chasquis" (messengers), the Spanish gave it to the workers in the silver mines, and at present times its use is spread among the native peoples of the Peruvian Sierra and among the Colombian "mombros" (those who use "mombi" or lime).
- The process of chewing coca in Peru and Bolivia is called "acullicar" or "chaccar" and it has remained unchanged since Inca times. Its use has also been recorded in Northwestern Argentina among the Kolla population and even among non-indigenous peoples.
- In the Amazon, coca is consumed in a different way: in Brazil, the leaves of coca are called "ipadu" and are roasted and milled until they turn into a fine powder. The Colombian Tanimuka also mill the leaves to obtain a fine powder which is later mixed with vegetal ash and resins, and inhaled in certain annual ceremonies (Schultes 1981, 1984).
- Coca also has a great variety of medical uses, such as taking an infusion prepared from for digestive problems or to relieve mountain sickness. Chewing it is good for healthy teeth and gums, and the powder of its leaves is used for the treatment of rheumatism and headaches.

Antiquity: Oldest use of coca in South America is estimated to be in shamanic practices and religious rituals. Shamans and healers praised its narcotic effects and the mental excitation that resulted from chewing the leaves and which allowed them to enter more easily a state of trance in which they could communicate with the spirits of Nature and obtain help from them.

Sculptures of faces with cheeks swollen by “acullico” have existed since the third century BC. (Escobedo 1996).

Records of use are found in Mochica pottery in 500 AD. at the coast of Northern Peru, where its use was restricted to people of high rank or priests.

The Incas also considered coca as one of the most sacred plants and its use was restricted to the nobility. They used it in religious rituals and for divinatory purposes. With the arrival of the Spaniards, the use of coca spread widely. Its effects on the human organism (calms hunger, fatigue, pain and mountain sickness) were considered supernatural. Its cult had political importance as well. One of the empresses or “coyas”, the wife of the Inca Mayta Capac, adopted the sacred name of “Mama Coca”, and so did the sister of the Inca Huayna Capac.

7) Genus NICOTIANA (36 subspecies in South America)

Family: Solanaceae

a) *Nicotiana tabacum* L.

b) *Nicotiana rustica* L.

Common names: tobacco, pëtre (mapuche), tupac sayri (incas)

Geographical distribution: It grows naturally in Mexico, Guyana, Venezuela, Brazil and Bolivia. At the present time it is widely spread in North and South America.

Form of life: Annual herb.

Components: Nicotine. Two alkaloids, known as harman and norharman, both having psychoactive qualities, were found in the *T. rustica* (Janiger 1975, Dobkin de Rios, 1976).

Types and modes of use by different indigenous groups:

- The most traditional form of using tobacco is to smoke its leaves, but they are chewed, taken in an infusion, ingested and inhaled as well. The tobacco is inhaled in low and humid valleys of the Amazon. The infusion is taken nasally in Peru. This kind of use is called “singar”.
- In early colonial epochs the Peruvians inhaled a powder based on the tobacco’s root, for medical purposes (Cobo 1964), but the powder is generally prepared out of milled leaves (Cooper 1949; Schultes 1967).
- The Jivaro (Karsten 1935), various ethnic groups of Northeastern Peru and the bush Negro of Guyana (Roth, 1929) inhaled the juice of tobacco leaves through the nose.

- The Arawak groups of the Purus River mix tobaccos' powder with vegetal ash (Cooper, 1949).
- The Mapuche call smoking "Pëtrem" as well as the ritual acts with which the old chiefs began their reunions and with which the machi still initiate the "machitun" (the healing of a patient). (Wilhelm de Mösbach 1992).
- The shamans of many ethnic groups used tobacco to "see" a patients' interior and to be able to diagnose the illness.
- Some Peruvian healers used tobacco's leaves as a plaster for snake bites (Domenech per.com. 1998).
- The Shipibo-conibo and the Asháninka used the smoke of tobacco as an additive to ayahuasca (Ott 1996).

The use of tobacco is spread all over the American continent in innumerable indigenous groups, always with the character of a ceremonial plant. It is the sacred plant with the widest dispersion in America. For many people it is the most important plant, which guides the other plants, as if it were a "general director" (Juan G. Flores Salazar, Asháninka shaman, pers. com. 1998).

Antiquity: There are some archaeological finds of pipes which show that the use of tobacco goes back about 3500 years (Saury 1980). Adopted by the Spanish, it had a quick diffusion all over the world and slowly converted in a industrial product, differing from the indigenous ritual use. In 1520, H. De Oviendo sent the first tobacco seeds to Spain. Jean Nicot, to which the European denomination of this plant is dedicated, introduced it in France in the sixteenth century.

8) Genus TRICHOCEREUS

Family: Cactaceae

a) *Trichocereus pachanoi* Britt. et. Rose

b) *Trichocereus terscheckii*

Common names: San Pedro (Coast of Northern Peru), achuma (Brazil), huachuma (Northern Andean Zone), aguacolla, gigaton (Ecuador).

Form of life: Cactus

Geographical distribution: In warm and moderate zones of Southern America. *T. pachanoi* is distributed in the center of the Andes between 1830m and 2750m above sea level, naturally growing or cultivated from Ecuador to Bolivia, passing through Peru. *T. terscheckii* is found in Northwestern regions of Argentina.

Components: They are rich in Mescaline, which represents 2% of their dry weight, other isolated alkaloids are 3,4 dimetoxifenitetilamine, 3-metoxitiramine and in the *T. terscheckii* N-DMT was isolated as well.

Types and modes of use by different indigenous groups:

- It is consumed by the natives of South America, especially in the Andes of Peru, Ecuador and Bolivia.
- Small pieces of the stem are sliced and cooked for several hours. Sometimes other plants like *Datura* for example, are added. This beverage is called “cimora”.
- At present, only the shamans and Peruvian healers ingest *T.pachanoi* for divinatory purposes, the diagnosis of illnesses, the combat of witches and for black magic.

Antiquity: It is one of the oldest sacred plants of South America. There are archaeological records of its use from 1550 BC (Cupisnique culture, Peru) and 1300 BC (Chavín culture, Peru). It was also used in the Nazca culture (100 BC– 500 AD). Representations of this cactus exist in lithic pottery and sculpture. Pieces of the cactus as offerings in funeral packets of – presumably Inca – mummies have been found in Northwestern Argentina (Peláez and Renard 1994 /5).

8) Genus VIROLA (60)

Fam. Myristicaceae

- a) *Virola theiodora* (Spr.) Warb.
- b) *Virola calophylla* Warb.
- c) *Virola calophylloidea* Markr.
- d) *Virola elongata* (Spr. Ex Benth.) Warb.

Common names: epená, ebená, nyakwana, paricá (Brazil) yakee, yato (Colombia)

Form of life: Tree

Geographical Distribution: It is distributed in tropical zones of Central and South America. Its origin is in the Western Amazon Basin. It is consumed in Brazil, Colombia, Venezuela and Peru.

Components: Triptamine-type alkaloids and beta-carboline, the principals are 5-meto-xidimetiltriptamine and dimetiltriptamine.

Types and modes of use by different indigenous groups:

- Some scrape the internal layer of the bark and dry the scrapings in the fire, which pulverises them and then they can be mixed with milled leaves of *Justicia*, ash of “amasita” and the bark of *Elisabetha princeps*.
- Others cut down the tree, take the resin, cook it in order to obtain a paste, dry it in the sun, mill it and sift it. It is also mixed with other plants as mentioned above.
- Another method is to knead the scraping of the bark, to extract the resin and cook it until it makes a paste, which is dried in the sun and to which ashes are added in order to prepare a “rapé” (powder).
- The Makú of the colombian Vaupes ingest the resin unaltered.

- Among other ethnic groups it is inhaled by all adult men and at occasions without ritual relation (in daily life).
- In Colombia, the use of this plant is restricted to the shamans.
- The healers or shamans (Barasana, Makuna, Puinave, Tucano, Kabuyare, Kuripako and other Colombian communities) use the substance for diagnosis and treatment of illnesses, for prophesying, divination and also for various magical-religious purposes.
- Its use is widely spread among indigenous groups of the Colombian Amazon, the Upper Orinoco Basin in Colombia and Venezuela, in Rio Negro and in other Western Amazon regions of Brazil. Its use is deepest-rooted among the Indians generically called Waika (Upper Orinoco in Venezuela and in the Northern Rio Negro), of which the Yanomami are the best known representatives.

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What are probably floral diagrams of these plant families are represented. The bell-shaped spindle whorls from the Quimbaya culture of Colombia have varied designs that resemble the campanulate flowers of *Brugmansia* (*Datura*, Solanaceae), which is known for its contorted flowers, and hallucinogenic effects. The native mythology and language, recorded in Mexico at the time of the conquest, indicates a pervasive interest in fruit and flower structure, which is reflected in the designs on the spindle whorls.