

REBAJE PALO: A CASE STUDY AMONG THE INDIGENOUS HEALERS OF IQUITOS (PERU)

CLAUDIO MAZZATENTA

The City University of New York, Bronx Community College, Biology and Medical Laboratory Technology Department, Bronx, NY 10453, USA; email: claudio.mazzatenta@bcc.cuny.edu

ABSTRACT: This study was conducted in the city of Iquitos (Peruvian Amazon) where the vast majority of indigenous healers use the psychotropic beverage *ayahuasca*, which owes its powerful effect mainly to the combination of two plant species, *Banisteriopsis caapi* (Spruce ex Griseb.) C.V. Morton and *Psychotria viridis* Ruiz & Pav. *Brebaje palo* is an alternative psychotropic drink, which has a similar effect to that of *ayahuasca* but is prepared with other plants. This research aimed to understand the preparation, the modality of the healing session, the efficiency, and the pharmacognosy of this drink and compare it to *ayahuasca*. It was found that *brebaje palo*, made with bark of different plants, has similar characteristics to *ayahuasca*. Alkaloids are present in *brebaje palo* and this could explain the psychotropic activity of the beverage that may be considered an alternative to *ayahuasca*. Recently, the ecological sustainability of the species used as ingredients of *brebaje palo* and *ayahuasca* was studied, as they might be threatened due to the intense and indiscriminate use in the region.

KEY WORDS: *Ayahuasca*, *brebaje palo*, ethnobotany, hallucinogenic plants, Peruvian Amazon.

RESUMO: Este estudo foi realizado na cidade de Iquitos (Amazônia peruana), onde a maioria dos curandeiros indígenas usa a bebida psicotrópica *ayahuasca*, a qual deve seus potentes efeitos principalmente à mistura de duas plantas, *Banisteriopsis caapi* (Spruce ex Griseb.) C.V. Morton e *Psychotria viridis* Ruiz & Pav. O *brebaje palo* é uma bebida psicotrópica alternativa, que provoca efeitos similares aos da *ayahuasca*, mas é preparado com outras plantas. A presente pesquisa teve como objetivos compreender a preparação, a modalidade das sessões de cura, a eficiência e a farmacognosia desta bebida comparando-a com a *ayahuasca*. Foi verificado que o *brebaje palo*, feito com casca de várias plantas, tem características similares às da *ayahuasca*. Há alcalóides no *brebaje palo*, o que pode explicar a atividade psicotrópica desta bebida, a qual pode ser considerada como uma alternativa à *ayahuasca*. Recentemente, a sustentabilidade ecológica das espécies usadas como ingredientes do *brebaje palo* e da *ayahuasca* foi estudada, pois podem estar ameaçadas em decorrência de uso intenso e indiscriminado na região.

PALAVRAS-CHAVE: *Ayahuasca*, *brebaje palo*, etnobotânica, plantas alucinógenas, Amazônia peruana.

INTRODUCTION

It is quite challenging to define "normal" consciousness and "altered" state of consciousness. Tart (1990, p. 1) suggested that "for any given individual, his normal state of consciousness is the one in which he spends the major part of his waking hours". There is evidence that for millennia people have used certain plants to induce altered states of consciousness. In fact, seeds of such plants were

found in deep strata dated back, by radioactive carbon studies, between 8440 and 8120 B.C. (Naranjo, 1995). Quite often these plants, called psychoactive, were used during rituals, ceremonies, and healing practices.

The research presented in this article was conducted in Iquitos, a major city in the Peruvian Amazon. Over time, people from different regions migrated to this area, which was very active during the rubber boom, in

search of job opportunities either in the lumber and petroleum industry or in other enterprises based on natural resources (McKenna et al., 1995).

This multitude of people has generated an interesting social structure influenced by many cultures combined and mixed together. The richness of the forest and the belief in local healing practices, quite different from the conventional Western tradition, resulted in common usage of the powerful drinks prepared from plant material by indigenous healers (shamans). Western missionaries either did not understand the culture of the region or preferred to disregard it (Luna & Amaringo, 1991), and even when Western religion was imposed, indigenous people were able to preserve their original beliefs over time. These people believe in a cosmology that is a combination of supernatural powers found in the forest, underwater, and underground, which has an impact on the life of human beings causing either wellness or illness (Sullivan, 1988).

Indigenous people of Iquitos still favor their own indigenous healers, not only because of their traditional belief, but also because modern health care is not affordable, not available, too far, or simply because of mistrust in modern medicine and technology. The healing process is quite often associated to drinks prepared with psychotropic plant material, but no other drink gained more attention than *ayahuasca* (McKenna, 2004), because this name has been associated to "drug tourism" (Dobkin de Rios, 1994, 2005, 2006) as well as to pharmacology and therapy (McKenna, 2004; Winkelman, 2005).

In the Peruvian Amazon, indigenous healers identify (Mabit et al., 1992) with *ayahuasca* [*Banisteriopsis caapi* (Spruce ex Griseb.) C.V. Morton], and the drink itself made mainly by *B. caapi* and *Psychotria viridis* Ruiz & Pav. (*chacrana*), even if other plants sometime may be added.

Luna & Amaringo (1991) show the two plants *ayahuasca* and *chacrana* deeply intertwined, as two multicolor snakes: one, *ayahuasca*, coming out from the vine, and the other, *chacrana*, releasing from its mouth a violet radiation that penetrates the mouth of the first

snake. This symbiosis indicates that the two plants must be fused together to be psychoactive.

The proposed pharmacognosy of the *ayahuasca* drink is explained as follows: monoamine oxidases (MAO) are enzymes that decompose, when taken orally, compounds with amino groups such as tryptamine (e.g. dimethyltryptamine - DMT), which, if not decomposed, could reach the brain and cause psychotropic effect. Beta-carbolines, such as harmine, harmaline and harman, are strong inhibitors of MAO (Udenfriend et al., 1958), and therefore can prevent oxidation of compounds such as DMT. The *ayahuasca* drink contains beta-carbolines (*Banisteriopsis*) and DMT (*Psychotria*), so the beta-carbolines act as a MAO inhibitor (MAOI) and protect DMT, which, in turn, reaches the brain and becomes psychoactive (McKenna, 2004; McKenna et al., 1984a, 1984b). Schultes & Hoffman (1980), recapitulating *ayahuasca* history, indicated that:

"The hallucinogenic effects of *ayahuasca* preparations may be the result of the combined activity of harmine and its derivatives with dimethyltryptamine and other tryptamine derivatives which were found in certain admixtures to *ayahuasca* such as *Banisteriopsis rusbyana* (Nied.) C.V. Morton and *Psychotria viridis* Ruiz & Pav. The MAO inhibitors harmine and harmaline may enhance the effects of the tryptamines. It should, however, be borne in mind that the narcotic is still hallucinogenic even when, as often is the case, it is prepared exclusively from species of *Banisteriopsis* without the tryptamine rich additives."

Luna & Amaringo (1991) reported that, in Iquitos, the *Mestizo* (mixture of indigenous tribes and people of European descent) identify themselves as *vegetalistas* to indicate that they acquired knowledge and personal power directly from plants, and they are classified in different categories based on their plant knowledge:

"Among *vegetalistas* we find *tabaqueros*, who use *tobacco*; *toeros*, who use various species of *Brugmansia*; *camalongueros*, specialists in the use of the seeds of a plant that has thus far escaped identification; *catahueros*, who use the resin of *catahua* (*Hura crepitans* L.); *paleiros*, who use the bark of various trees such as

ayahuman (*Couroupita guianensis* Aubl.), *huacapu* (*Minquartia guianensis* Aubl.), *clavohuasca* (*Tynanthus panurensis* (Bureau) Sandwith), *chuchuhuasca* (*Heisteria pallida* Engl.), *chullachaki-caspi* (*Byrsonima christianeae* W.R. Anderson), *remocaspi* (*Aspidosperma excelsum* Benth.), and many others; and *perfumeros*, who employ the scents of various fragrant plants. But, by far, most *vegetalistas* practicing in the Peruvian Amazon are *ayahuasqueros*, specialists in the use of *ayahuasca*."

Shamans are also very creative and try new things, such as mixing different plants together. Thus *ayahuasqueros* can also be *paleros*, if they also use the bark of *palos* to prepare the beverage, and then they are called *ayahuasqueros paleros*. The word *palo* comes from the Latin *palus*, borrowed from the ancient Greek *palos*, which means stick, and it refers to the straight structure of big trees, usually very tall, whose bark is used by the *palero* shamans. *Paleros* have gained an ambivalent reputation, because, even if their plants knowledge is outstanding, their healing practice has been tarnished, since it has been associated with witchcraft (Luna, 1984a): "And, of course, there are always 'vegetalistas' [...] who know more than him. These are *paleros* (from 'palo', a Spanish word meaning in this area something like 'big tree'), who have taken very strong drugs from trees and dieted. Quite often the concept of *palero* is associated with that of a witch. That is because the temptation to use evil powers is stronger the more is learned, that is why there exists a hierarchy among shamans, depending on the knowledge they have, or in other words, depending on the number and type of plants they master."

Many *palos* are very tall trees capable of resisting rains, winds, and flooding. These plants teach medicine to shamans if they take them and follow a proper diet. The strength of these trees can withstand the power of the elements and it can be transferred to shamans who will be strong and knowledgeable.

According to Perlmutter (2003/2004), the word *palero* has also been used to identify practitioners of *Palo Mayombe*, a syncretic Afro-Cuban belief that fuses elements of Afro-Congo tribes and religious practices of Yoruba slaves and Catholicism: "*Palo Mayombe*, de-

rived from the Spanish *Palo* meaning 'wooden stick' or 'branch' and referring to the pieces of wood practitioners use for their magic spells".

Sanchez (2000) indicated that "The emphasis of the Bantú/Congo religious practices lies in the magical or sorcery aspects of African beliefs, in tandem with healing practices. The name 'palo' denotes the trunks and branches from the forest (*el monte*) utilized in the elaboration of a sacred object (*nganga*) used for spells. Often maligned, practitioners of *Palo* (*paleros*) are accused of practicing black magic or witchcraft, with rites utilizing corpses and dangerous herbs and spells for evil purposes."

The establishment of a connection between *paleros* in Cuba and in the Peruvian Amazon is open to speculation, but these people certainly have in common a power derived from their knowledge and social status, their practice of healing and their association with witchcraft. Bettelheim (2001) said that *Palo Monte* has its origin in the kingdom of Kongo in Central Africa and stated that: "It is intriguing to speculate on the origins of its Spanish name, for within the religion *palo monte* refers to 'spirits embodied in the sticks in the forest'. A *palo* is a segment of wood; *monte* is the forest or a rural area, where local rule is dominant. *Palo* also describes the sections of wood that form a palisade around a military outpost or rural stronghold. As such, the name of the religion reflects the reputation of people of Kongo descent in Cuba; they are rural, strong, and strong willed."

Dobkin de Rios (1972), who extensively studied *ayahuasca* in Iquitos, indicated that a large number of people from other countries had been attracted by this psychotropic drink generating a new trend called "drug tourism" (Dobkin de Rios, 1994). From his documented experience on the beverage, Winkelman (2005) reported positive comments by people who took it. Recently, Dobkin de Rios (2006) expressed her concern on the ecological sustainability of the plants used to prepare the beverage due to the rapidly growing number of tourists visiting the area.

The study here presented was inspired by information supplied by Luna (1984b), who

reported that an Iquitos shaman substituted *chacrana* with shoots of *tangarana* (*Triplaris* sp.) as an additive to the *ayahuasca* drink with positive results. Following this lead, between 1997 and 1998 an investigation was conducted in Iquitos to establish the possible use of other plants with psychotropic activity to substitute *chacrana*, which is very expensive on the local market (about US\$ 30.00/kg). During this study, the initial research was undertaken with a *palero*, who used the hallucinogenic drink *brebaje palo* prepared without *Banisteriopsis* and *Psychotria* for his healing practice. Therefore, the investigation was expanded and the objectives of the present study are to increase the knowledge about *brebaje palo*, verify possible similarities with *ayahuasca*, and compare the two of them. Relevant also to the new concern on *ayahuasca* sustainable use in the Iquitos region (Dobkin de Rios, 2006), the data collected at that time were reexamined for study and discussion.

Often indigenous people either cannot afford modern medicine, hospitals are too far, or they mistrust the new technology. Thus, they often prefer to contact traditional healers, also because they have a different concept of disease and healing from that of the Western culture. Indigenous people believe in a connection between sickness and supernatural power.

The use of psychotropic plants allows access to information that will be used to prescribe the remedy to cure. Shamans differentiate plants that are *purga* and plants that are just medicinal. The word *purga* (purge) comes from Latin and means "to clear or free". Shamans identify with *purga* the plant that "teaches" medicine (Luna, 1984b). Later, after interpretation of the information given by the patient under the influence of the *purga* the shaman can prescribe the remedy that is the medicinal plant. Therefore, the *purga* has only psychotropic effect to help the shaman to cure the patient. When shamans say that the *purga* cures all diseases, they refer to its psychotropic effect, which is the first step of the healing process. Only through the analysis of the information from the patient under the influence of the drink the shaman can provide appropriate prescription.

For modern medicine, this procedure cannot be considered scientifically approved. The healing skill of a shaman and his reputation among people is measured on his ability to provide the right remedy (medicinal plant) to the patients. If the patient can recuperate from his/her sickness news will be spread through the community and the shaman will gain social status as outstanding healer.

Dobkin de Rios (1972) interviewed many patients in Iquitos area and the healing of one of them is here reported:

"One day, Juana told of her experience with an *ayahuasquero*. She had developed a skin ailment which responded poorly to the pharmaceutical medicine prescribed by a town doctor. No one seemed able to help her. She finally visited an *ayahuasquero* and took the purge. While under the effects of the drug, she saw her mother in law (with whom she got on badly) prepare a concoction and slip it to her in a meal, causing her to become ill. She only visited the healer once. He gave her a salve to place on the ailment, and told her he would neutralize the magic and make her better. The skin problem cleared up almost immediately and since that time she had no occasion to return to the healer".

MATERIAL AND METHODS

Hypothesis: *Brebaje palo* is a hallucinogenic beverage prepared without *B. caapi* and *P. viridis* that has similar effect to the *ayahuasca* beverage.

Research questions:

- 1) What plants are used to prepare the *brebaje palo* beverage?
- 2) How is the beverage prepared?
- 3) Who takes the beverage?
- 4) How is the healing session done?
- 5) Can the *brebaje palo* beverage be compared to the *ayahuasca* beverage?
 - a) Which of the two beverages is more efficient for cure?
 - b) Which of the two beverages is easier to prepare?
 - c) Which of the preparations is more expensive?

d) How is the pharmacognosy of *brebaje palo* compared to that of *ayahuasca*?

RESEARCH LOCATION: QUITOS CITY AND SURROUNDINGS.

The guidelines of Alexiades (1996), Boom (1990), Martin (1995), and Posey (1991, 1992) were used for this investigation.

An appropriate Peruvian-born liaison, raised there and educated in Peru and in the USA, with extensive knowledge on plant sciences, introduced the researcher to local people and to a professor of the *Universidad Nacional de la Amazonia Peruana* (UNAP) in Iquitos. After having been informed about the purpose of the study, this professor coordinated the shamans' interview in the evening when they had more free time to be engaged in conversation. One *brebaje palero*, who does not use *B. caapi* nor *P. viridis* to make the hallucinogenic drink, and three *ayahuasqueros* were interviewed either at home or in their ambulatory, where patients go for assistance. Conversations were conducted by the academic of the UNAP and data were registered on paper and with a tape recorder.

Due to the fact that shamans either buy plant material directly at the local market or go to the forest, samples were not available and collection could not be carried out. Therefore botanical identification was made in the field and plants are indicated with their vernacular name, as provided by healers. Each vernacular name is accompanied with the correspondent scientific name in parenthesis, using as general guide the *Amazonian ethnobotanical dictionary* by Duke and Vasquez (1994) and the *Vocabulario Regional del Oriente Peruano* by Castonguay (1990).

The interview protocol (Alexiades, 1996) was mainly based on casual conversation, unstructured interview, or more articulated, semi-structured interview, combining, according to the circumstances, open, direct or closed questions. The researcher participated minimally in this task, leaving the academic of the UNAP, aware of the objective of the study, completely free to carry out the conversation with people of the same origin and culture.

RESULTS AND DISCUSSION

Shaman #1, Don Erasmo, said that he had been working for over 25 years with *ayahuasca* to cure, to see and to clarify things that somebody desires to see. He does not own a garden but goes instead to the forest to obtain plants. He prepares the drink *ayahuasca* with bark of *ayahuasca* (*B. caapi*), leaf of *chacrana* (*P. viridis*), bark or leaf of *ipururo* (*Alchornea* sp.), but the following plant material can be added: bark of *ayahuma* (*Couroupita* sp.), leaf of *ciricsanango* (*Brunfelsia* sp.), bark of *cumaceba* (*Swartzia* sp.), bark of *huacapurana* (*Campsiandra* sp.), bark of *lupuna* (*Ceiba* sp.), bark of *remocaspi* (*Aspidosperma* sp.), and leaf of *toé blanco* (*Brugmansia* sp.). When the *ayahuasca* mixture is strong, the healing power is said to be strong and effective for all diseases; however, it has never been tested for aids.

Shaman # 2, Don Cristobal, said that he had been working with *ayahuasca*, which he prepares at home, for over 47 years. He does not own a garden, but instead he buys the plant material. He said that *ayahuasca* is a plant that teaches many things if one wants to learn by dieting and trying. He added that *ayahuasca* causes dizziness and *chacrana* causes hallucination (*vision*). Some healers mix the beverage with other plants, while he adds only *chacrana* to *ayahuasca* or *toé blanco* as alternative, but not *toé negro* (*Teliostachyia* sp.), which is used for witchcraft (*brujeria*).

Shaman #3, Don José, said that he had been using *ayahuasca* for 52 years. He does not own a garden, but he buys the plants from a person who grows them in the forest. He was 12 years old when he first took the beverage and 18 when he started working with it after dieting for four years in the forest. He indicated that the word *ayahuasca* means "vine of the dead" (*aya* = *soga* = vine; *huasca* = *muerto* = dead, and therefore it is the "*soga del muerto*"), and also that the secret of the beverage is endless because every day something new is discovered.

The drink is taken as an intermediate to identify the illness and understand the plants required to cure it. *Ayahuasca* is mixed with *chacrana* (also called *samiruca*) because without these plants the drink has no strength. The leaves of *chacrana* are collected early in the

morning, washed and gently added when *ayahuasca* begins to boil. This mixture is cooked for 8 hours. Don José implied that this preparation of *ayahuasca* cures “350,000 diseases” and also drug addiction, such as to marijuana or cocaine, but it has never been tested for aids patients.

When the *ayahuasca* drink is mixed with other plants, a major diet is required to weaken the body. Additional material can be added to make the beverage stronger, such as *toé blanco* and *sanango* (*Tabernaemontana* sp.), which can be dangerous since these plants can affect the blood with bruises on the skin, or creolin (chemical disinfectant), tobacco leaves (*Nicotiana tabacum* L.), roots of *huasai* (*Euterpe* sp.), and resin of *catahua* (*Hura crepitans* L.). Don José also recommended not eating pork meat during the treatment. Regular diet lasts for 24 days, but if pork meat is eaten three additional days are required.

Shaman #4, Don Humberto, said that he had been working with this beverage for over 35 years, and that he is a *palero* and not *ayahuasquero*. He informed that some *ayahuasqueros* are also *paleros*, because they add plant material from *palo* trees to the drink *ayahuasca*, as indicated by Don Erasmo. Don Humberto said that he does not cure with *ayahuasca* (he uses neither *B. caapi* nor *P. viridis*), but with a drink called *brebaje palo*, prepared by mixing bark of different trees. The academic of the UNAP, who is a chemist, performed an analysis of this drink and confirmed that it contains alkaloids.

Don Humberto is a *medico naturista* (naturalist doctor), who owns a clinic with many beds and has an authorization from the Health Department of the City and additional licenses to practice “natural medicine.” He initiated his apprenticeship when he was 15 years old and practiced diet for three years. He also went to Belém, in the state of Pará, Brazil, to master his healing skills. There, he studied medicine in a building called *A Bola de Cristal* (The Crystal Ball), where it was also possible to learn *Macumba*, a syncretic belief characterized by mixed elements of African religions, European culture, Brazilian Spiritualism, and Roman Catholicism, considered by some people in a derogatory and offensive way, because of its association with witchcraft.

Don Humberto prepares *brebaje palo* with the bark of the following plants: *ajos kiro* (*Cordia* sp.), *almendro* (*Terminalia* spp.), *ayahuma* (*Couroupita* sp.), *azucar huayo* (*Hymenaea* sp.), *bubinsana* (*Calliandra* spp.), *capirona negra* (*Capirona decorticans* Spruce), *charapilla* (*Capsicum* spp.), *chullachaqui caspi* (*Remija* sp.), *cocobolo* (*Dalbergia* spp.), *cumazeba* (*Swartzia* spp.), *huacapu* (*Minquartia* sp.), *huayracaspi* (*Brosimum* sp.), *itauva* (*Mezilaurus* sp.), *machimangua* (*Eschweilera* sp.), *metohuayo* (*Caryodendron* sp.), *palisangre* (*Brosimum guianense* (Aubl.) Huber), *pucaquiro* (*Simira* sp.), *remocaspi* (*Aspidosperma* sp.), *requia* (*Carapa* sp.), *tahuari amarillo* (*Tabebuia* sp.), *tahuari negro* (*Tabebuia* sp.), *tamamuri* (*Brosimum* sp.) and he also adds *tobacco* (*Nicotiana tabacum* L.) to induce dizziness. He cooks equal parts (about 20 g of each ingredient) of about 10-12 pieces of bark of different trees to prepare the hallucinogenic drink. He said that it is good for all diseases (e.g. heart, head, and eye diseases).

It was possible to follow a ceremony carried out to cure a patient. The ceremony took place in a large room, where the master of ceremony, shaking the *shapaya* (musical instrument), recited prayers and sang *icaros*. The patient was in the middle of the room, while all the others waited on the sides of the room. The healing sessions take place on Fridays, beginning at about 10 pm, and they can continue until 3-4 am of the following day, depending of the number of patients, which might vary, and can be as many as 10 to 50 or more.

Don Humberto said he uses roots of *huasahi* (*Euterpe* sp.) to cure cancer, and bark or leaf of *toronja* (*Citrus* sp.) and leaves of *achiote* (*Bixa orellana* L.) to cure aids. Two adults, who were 35 and 21 years old, and an 8-year-old boy claimed to have been cured. Also, 12 drug addicted patients were cured with *agua de achiote* (*B. orellana*) and roots of *sacha cilantro* (*Eringium* sp.), which purifies the blood and the stomach, and leaves of *tutumo* (*Crescentia cujete* L.) to suppress appetite. For gastritis, 15 leaves of *achiote* (*B. orellana*) are boiled in one liter of water for 10 minutes, and the resulting beverage should be taken for three days.

Don Humberto also said that the vast majority of Iquitos shamans are *ayahuasqueros*, and that *paleros* are very few, and most of

them use only one *palo*, such as *chullachaqui caspi* (*Remija* sp.) or *sanango* (*Tabernaemontana* sp.), in which case they are called *sanangheros*. There are also other shamans called *maleros*, who practice witchcraft to cause damage, and they can add small pieces of *chambira* (*Astrocaryum chambira* Burret), leaves of *yarina* (*Phytelphas macrocarpa* Ruiz & Pav.), *toé negro*

(*Teliostachyia* sp.), and *catahua* (*Hura crepitans* L.) to the *ayahuasca* beverage.

The number of plants used in the preparations and mentioned by *ayahuasquero* and *palero* shamans is shown in Figure 1. The list of the plants mentioned by the shamans is presented in Table 1.

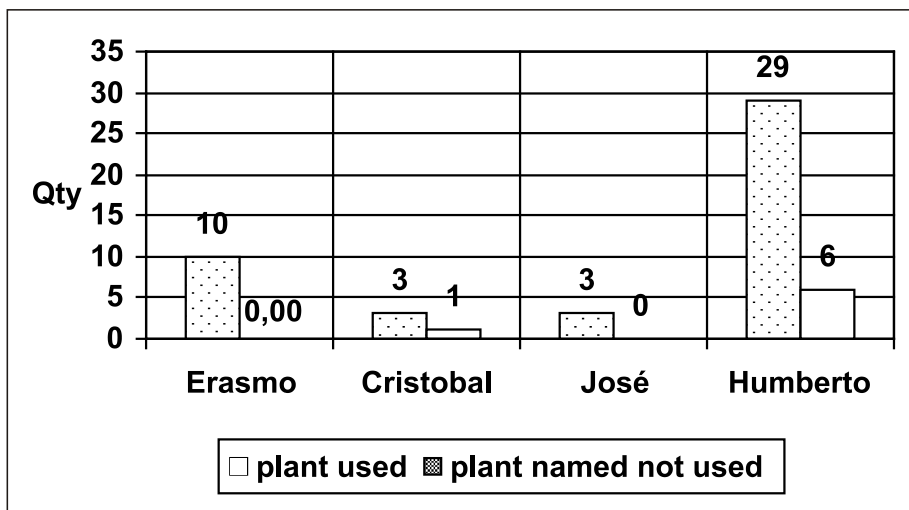


Figure 1 – Number of plants used and mentioned by *ayahuasquero* and *palero* shamans.

Shamans either indicated that the hallucinogenic drink can cure all diseases or they did not specify this characteristic at all. As pointed by Sullivan (1988), illness is perceived by indigenous people as caused by forces that cannot be fought with the conventional remedy proposed by Western medicine. The hallucinogenic drink provides access to the information that suggests the correct cure, and therefore the power of the drink is universal and all diseases can virtually be cured.

Ayahuasqueros confirmed that *B. caapi* and *P. viridis* are the two key components used in the *ayahuasca* drink, but also that the effect of the drink changes if other plants are used. Don José, for example, said that if *ayahuasca* has no strength, *toé* and *sanango* can be added. Nevertheless, the plant knowledge of *ayahuasqueros* is limited when compared with that of the *paleros*. Luna (1984b) said that “a poor little *ayahuasquero* would be at the mercy of anyone knowing more than him.” Don Humberto, who is a *palero*, has a broader knowledge and experience than the *ayahuasqueros*, as indicated by the long list of plants

that he uses and the knowledge of their healing power, such as for drug addiction. He also indicated that, in addition to bark, other plant parts (leaf and root) are also used for healing. The UNAP academic said that a preliminary chemical investigation indicated the presence of alkaloids in *brebaje palo*, although the lack of adequate instrumentation prevented further studies.

Ayahuasca is mainly prepared with *B. caapi* and *P. viridis*, which can be found in the forest and in the outskirts of the city, respectively. Due to the large demand for the first plant (about 300 leaves are required to prepare between half liter and three quarter liter of drink) there is a tendency to transplant it close to the city for easy access, while it is not easy to transplant the second one, which is a vine.

Don Humberto said that he collects plant material (from 10 to 12 different types of bark) from the forest to prepare *brebaje palo*. Because the *ayahuasca* beverage requires a minimum of two plants, even if other ones can be added to enhance the strength of the drink, it would be

Table 1 – List of the plants mentioned by the shamans interviewed, presented by their vernacular names and correspondent cross-reference with botanical name.

Vernacular name	Scientific name	Family	A	B	C
Achiote	<i>Bixa orellana</i> L.	Bixaceae	4		No
Ajos kiro	<i>Cordia</i> sp.	Boraginaceae	4		No
Almendo	<i>Terminalia</i> sp.	Combretaceae	4		No
Ayahuasca	<i>Banisteriopsis caapi</i> (Spruce ex Griseb.) C.V. Morton.	Malpighiaceae	1/2/3	4	Yes
Ayahuma	<i>Couroupita</i> sp.	Lecythidaceae	1/4		Yes
Azucarhuajo	<i>Hymenaea</i> sp.	Fabaceae	4		No
Bubinzana	<i>Calliandra</i> sp.	Fabaceae	4		Yes
Capirona negra	<i>Capirona decorticans</i> Spruce	Rubiaceae	4		Yes
Catahua	<i>Hura crepitans</i> L.	Euphorbiaceae	3	4	Yes
Chacrana	<i>Psychotria viridis</i> Ruiz & Pav.	Rubiaceae	1/2/3	4	Yes
Chambira	<i>Astrocaryum chambira</i> Burret	Arecaceae		4	No
Charapilla	<i>Capsicum</i> sp.	Solanaceae	4		Yes
Chullachakicaspi	<i>Remija</i> DC.	Rubiaceae	4		No
Ciricsanago	<i>Brunfelsia</i> sp.	Solanaceae	1		Yes
Cocobolo	<i>Dalbergia</i> sp.	Fabaceae	4		No
Cumazeba	<i>Swartzia</i> sp.	Fabaceae	1/4		No
Huacapu	<i>Minquartia</i> sp.	Olacaceae	4		No
Huacapurana	<i>Campsiandra</i> sp.	Fabaceae	1		Yes
Huayracaspi	<i>Brosimum</i> sp.	Moraceae	4		No
Huasahi	<i>Euterpe</i> sp.	Arecaceae	3/4		No
Iporuro	<i>Alchornea</i> sp.	Euphorbiaceae	1		Yes
Itauva	<i>Mezilaurus</i> sp.	Lauraceae	4		No
Lupuna	<i>Ceiba</i> sp.	Bombacaceae	1		Yes
Macimangua	<i>Eschweilera</i> sp.	Lecythidaceae	4		No
Metohuayo	<i>Caryodendron</i> sp.	Euphorbiaceae	4		No
Pucaquiro	<i>Simira</i> sp.	Rubiaceae	4		Yes
Remocaspi	<i>Aspidosperma</i> sp.	Apocynaceae	1/4		No
Requia	<i>Carapa</i> sp.	Meliaceae	4		No
Sacha culantro	<i>Eringium</i> sp.	Apiaceae	4		No
Sanango	<i>Tabernaemontana</i> sp.	Apocynaceae	3	4	Yes
Tahuarí amarillo	<i>Tabebuia</i> sp.	Bignoniaceae	4		Yes
Tahuarí negro	<i>Tabebuia</i> sp.	Bignoniaceae	4		Yes
Tamamuri	<i>Brosimum acutifolium</i> Sw.	Moraceae	4		No
Tangarana	<i>Triplaris</i> sp.	Polygonaceae			Yes
Tabaco	<i>Nicotiana tabacum</i> L.	Solanaceae	3/4		Yes
Toé blanco	<i>Brugmansia</i> sp.	Solanaceae	1/2/3		Yes
Toé negro	<i>Teliostachyia</i> sp.	Acanthaceae		2/4	Yes
Toronja	<i>Citrus</i> sp.	Rutaceae	4		No
Tutumo	<i>Crescentia cujete</i> L.	Bignoniaceae	4		No
Yarina	<i>Phytelephas macrocarpa</i> Ruiz & Pav.	Arecaceae		4	No

A - used by shaman; **B** - named by shaman; **C** - named (Yes/No) by Ott (1994) for *ayahuasca*; Shaman #1 - Don Erasmo; Shaman # 2 - Don Cristobal; Shaman #3 - Don José; Shaman #4 - Don Humberto.

theoretically easier to collect plant material for *ayahuasca* than for *brebaje palo*.

Iquitos shamans said that they do not have a private garden, but acquire plant material from outside sources (only Don Erasmo said that he personally goes to the forest to collect plant material). Therefore it could be fair to say that there is no major difference in acquiring plant material for *ayahuasca* or *brebaje palo*.

Several questions might be asked when comparing the preparations of *ayahuasca* and *brebaje palo*:

a) Which of the two beverages is more efficient for cure?

Ayahuasquero Don Erasmo did not specify the diseases that can be cured by *ayahuasca* but he said that it had never been tested for aids. Don Cristobal did not mention which diseases can be cured either. Don José said that all diseases can be cured by *ayahuasca*, including drug addiction, but it has never been tested for aids patients. Two of the *ayahuasqueros* said that their drink cures all diseases but has not been tested for aids; however, Don Humberto said that *brebaje palo* cures all diseases including aids and drug addiction, and this information would give a higher score to this drink. Don Humberto, like other paleros, has more plant knowledge than *ayahuasqueros*. Besides, it is not *brebaje palo* that cures *per se*, but the ability Don Humberto has to interpret what his patients report after intoxication with this beverage. Due to his extensive plant knowledge it is easier for him than for an *ayahuasquero* to prescribe the medicinal plant to cure the patients.

b) Which of the two beverages is easier to prepare?

Ayahuasqueros explained that usually a whole day is necessary to prepare the beverage, while Don Humberto did not specify the exact time. It is safe to say that at least few hours may be required to cook between 200 g and 240 g of bark (from 10 to 12 bark pieces of 20 g each).

c) Which of the preparations is more expensive?

Psychotria leaves are expensive (about US\$ 30.00 per kg at the time of this research), but the *ayahuasca* drink needs only two plants

(additional species may be optional). On the other hand, *brebaje palo* requires between 10 to 12 different barks, may require more time to collect them, and therefore may be more expensive. However, Don Humberto has a large number of patients coming to his office for cure. Thus if the drink preparation is expensive, on the other hand the high number of patients paying for his service would compensate the purchasing of the plant material.

d) How is the pharmacognosy of *brebaje palo* compared to that of *ayahuasca*?

It is widely accepted that the proposed synergetic mechanism between beta-carbolines harmin and harmaline of *B. caapi* and tryptamine of *P. viridis* induce hallucination. However, Schultes & Hofmann (1980) indicated that the *ayahuasca* drink "is still hallucinogenic even when, as often is the case, it is prepared exclusively from species of *Banisteriopsis* without the tryptamine rich additives". Mabit et al. (1992) also indicated that *Banisteriopsis* is mainly responsible for hallucination. Nevertheless, many factors can provide different concentrations of both beta-carbolines and tryptamine in different preparations (Ott, 1994).

However, whether *Psychotria* or *Banisteriopsis* is most responsible for hallucinations, these plants are not part of *brebaje palo*. What is instead the pharmacognosy of *brebaje palo*? Don Humberto said that the beverage is prepared with a mixture of barks from 10 to 12 different species of trees that, after cooking, becomes a unique blend. It is then challenging to establish the active compounds, because cooking (high temperature) can cause chemical reactions leading to new compounds and interactions among them, which might not be generated if the plant material is not mixed. It was reported by the UNAP chemist liaison that the drink contains alkaloids and it is well known that many alkaloids have hallucinogenic activity (Schultes & Hofmann, 1980).

Don Humberto said that some paleros use one *palo* only. This would generate the following questions:

a) Did paleros, who use only one *palo*, provide the correct information to Don Humberto? And, if so, is it correct to say that a single *palo* species can induce psychotropic effect?

Shamans are always competitive and do not like to share secrets. Thus the information provided by Don Humberto should be carefully considered. In fact, Schultes and Hofmann (1980) indicated that “*Banisteriopsis* without the tryptamine-rich additives [i.e., *Psychotria*] can cause hallucination”.

b) Does the beverage prepared by Don Humberto, aside from provoking hallucination, have healing effects, since many plants used may also have healing properties?

The chemical activity of some compounds has already been identified for some *palos*, but the chemical characteristics of the blend are still unknown. Alkaloids can change molecular configuration because they are unstable compounds. This way, it is possible that the alkaloids found in the boiled barks are different from the ones contained in the raw barks; and it is also feasible that the alkaloids from individually boiled barks are different from the ones found in barks boiled together.

The beverage prepared by Don Humberto shares with the one made by Don José the use of *ayahuma* (*Couroupita*), *cumazeza* (*Swartzia*), and *remocaspi* (*Aspidosperma*), whereas it shares with the one fixed by Don Erasmo the use of *huasahi* (*Euterpe*) and *tobacco* (*Nicotiana*). It is also possible that, if other *ayahuasqueros* are interviewed, the list of the plants used may increase.

If all *palos* mentioned by Don Humberto are compared to the plants used to prepare the *ayahuasca* drink (Ott, 1994), *ayahuma* (*Couroupita*), *bubinzana* (*Calliandra*), *capirona negra* (*Capirona*), *tahuari amarillo* (*Tabebuia*), *tahuari negro* (*Tabebuia*), and *charapilla* (*Capsicum*) were already indicated by Luna (1984a), Rivier & Lindgren (1972), and Schultes & Raffauf (1990) as additives to the *ayahuasca* drink, although without psychotropic effect.

All the other *palos*, *ajos kiro* (*Cordia* sp.), *almendro* (*Terminalia* sp.), *azucar huayo* (*Hymenaea* sp.), *chullachaqui caspi* (*Remija* sp.), *cocobolo* (*Dalbergia* sp.), *huacapu* (*Minquartia* sp.), *huayracaspi* (*Brosimum* sp.), *itauva* (*Mezilaurus* sp.), *machimangua* (*Eschweilera* sp.), *metohuayo* (*Caryodendron* sp.), *palisangre* (*Brosimum guianense*), *pucaquiro* (*Simira* sp.), *remocaspi* (*Aspidosperma* sp.), *requia* (*Carapa* sp.), *tamamuri* (*Brosimum* sp.), listed by Ott (1994) for the

preparation of *ayahuasca*, do not belong to the list of the plants containing MAOI beta-carbolines, or containing tryptamines. Thus these *palos* could not be responsible for hallucination.

Tobacco, which is not a *palo*, but is in the list of the additives used in the *ayahuasca* preparation, could be considered for possible psychotropic effect, possibly when mixed with other ingredients, because many members of the Solanaceae family contain psychotropic compounds. Don Humberto said that tobacco is used during the ceremony to induce dizziness (*mareación*). Could tobacco alone be so strong as to induce complete hallucination? Or, could tobacco create these effects when in conjunction with other chemicals in the drink? Wilbert (1987) believed that the real power derives from tobacco, which Don Humberto blows off during the ceremonies. However, indole alkaloids are found in *Couroupita* (Bergman et al., 1977; Sen & Mahato, 1974), *Aspidosperma* (Mitaine et al., 1998; Pereira et al., 2007), and because indole is the skeleton of many hallucinogenic compounds, such as DMT, found in *Psychotria*, and highly responsible for hallucination, this characteristic could support the hypothesis that the two drinks have similar effect because they share compounds with similar characteristics. In addition, *tamamuri* (*Brosimum* sp.) has hallucinogenic activity (Grenand et al., 1987), even if not included in the list of plants used for *ayahuasca* preparation by Ott (1994).

Can we also establish which drink was used first? Don Humberto proved that shamans are very creative and like to try new plants and new plant combinations. Thus it is possible that *brebaje palo* is a newer practice, compared to *ayahuasca*, and might even have originated from it, induced by the multicultural interactions in the Iquitos region. In 1851, Spruce had the first information about what was later called *ayahuasca* (Schultes & Hoffman, 1980), but it is not known for how long the Tukanoan tribe of the Rio Uaupes, Amazonian Brazil and Colombia, used a liana called *caapi* to prepare a beverage that causes intoxication.

Luna (1984b) indicated that a shaman used *Triplaris surinamense* in substitution of *P. viridis*. Don Cristobal said that *Brugmansia*

sp. (*toé blanco*) can be used in substitution of *P. viridis*. It is well known that *Brugmansia* sp. is very powerful and Luna (1984b) stated that only two leaves of this plant are sufficient in the preparation of the *ayahuasca* mixture. The strong power of *Brugmansia* sp. (*toé blanco*) was also reported by Schultes and Hoffman (1980).

Can the widespread use of *ayahuasca* have an impact on the ecology of the plants that make the drink and cause scarcity in the future? *Chacrana* should be easily available in the upper land and in the low land, and so it would be difficult to anticipate ecological disruption because of that. Recently, Dobkin de Rios (2006) was deeply concerned by the "drug tourism" in the area and indicated that "*Ayahuasca* is disappearing as a sustainable plant in the Amazon, often replaced by the use of tobacco."

CONCLUSION

The hypothesis that *brebaje palo* is as effective as *ayahuasca* could be supported by the chemical analysis of the plants used in the mixture, such as *Couroupita* and *Aspidosperma*, which contain indole alkaloids similar to DMT, highly responsible for hallucinogen activity in *ayahuasca*. The preparation of *brebaje palo* has been indicated and it is very similar to that of *ayahuasca* since plant material is boiled for both drinks. There is no major difference in collecting plant material, with the exception that *Psychotria* leaves are very expensive.

The pharmacognosy is complex and, although the synergetic mechanism was described by McKenna et al. (1984a, 1984b), *ayahuasca* is still a "mystery" (McKenna et al., 1995). The same could be stated for *brebaje palo*, even if the presence of alkaloids was confirmed by the chemist liaison.

The entire study should not be separated by the context where it was done. Indigenous healers have a different perspective of health and disease that does not match Western medicine. This way, not only the information provided should be accepted under these circumstances, but sometimes it could also be in contradiction with our expectations. The

information has been reported literally as it was collected, and may generate some doubt, such as the veridicality of saying that "a certain plant can cure all diseases." The entire healing process should be understood as part of a ceremony during which the rational parameters of modern sciences might treat this with certain skepticism. However, indigenous people go to local healers because this practice "works" for them.

More questions could have been asked, but the researcher did not want to obtain fictitious answers that could have been given just to please who asked them. When Don Humberto indicated that some *paleros* use one *palo* only, he was questioned "*One palo only?*" and he answered "*Yes.*" This answer is very questionable, considering that he mixes between 10-12 different barks. Shamans can be very secretive and might provide misleading answers to protect their knowledge. Other shamans were interviewed, also with the support of native assistants, in the surroundings of Iquitos, in the higher localities, and in a village along the Amazon River. In these localities it could be observed that sometimes, when the same questions were repeated at different intervals, the answers were not complete and satisfactory; therefore, the questions were dropped.

Major guidelines were indicated at the National Aboriginal Health Organization (NAHO) on *Traditional medicine in contemporary contexts*, by Hill (2003) to protect and respect indigenous knowledge and medicine.

Relevant to Peru, Greene (2004) presented an extensive report on the Aguaruna International Cooperative Biodiversity Groups (ICBG) that offers ground to open discussion on intellectual property rights. The Co-Ordinating Body for Indigenous Organization of the Amazon Basin (COICA), after the patent (no. PP5751) for *B. caapi* was granted to Miller, called the recipient "enemy of indigenous people" (Roopnaraine, 1998). These actions, rightly motivated, put research projects in connection with a number of complex issues. For example, in order to further the study on the *brebaje palo*, phytochemical analysis should be recommended, but the Aguaruna ICBG event could prevent permit for this type of study. It is possible to have permission for plant collection, but not for their analysis.

The recent concern of Dobkin de Rios (2006) about *ayahuasca* sustainability should be seriously addressed. An average of 300 leaves of *P. viridis* is needed to prepare the beverage. A detail study on the sustainable extractivism of *ayahuasca* ingredients could clarify the risk and threats to these species as well as to their natural environment. A study in this direction might also help to understand the impact of alternative preparations, such as the *brebaje palo*.

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