COURSE ECONOMIC BOTANY, YEAR 2013

Tabernanthe Iboga

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Table of contents

Introduction

From the observations and experimentations, the human has approached the nature and has evolved knowledge of classification and preferential manners of selection, which may benefit the maintenance and the development of their cultural, social and economical system. The domestication of crops and plants and the birth of the agriculture involved the anthropogenic manipulation of the nature and raised the socio-cultural barriers which were at the basis of the growth and regulation of economical trade. The topic of animal-plant interaction and exploitation of the plants for their medicinal properties and consequent economical values will be discussed. More specifically, the focus will be on Tabernanthe iboga.

Tabernanthe iboga is an often occurring shrub in the rainforest of West Africa. Interests in the shrub have mainly been driven by its active alkaloids, exerting a stimulant effect, used in African rituals and as stimulant in suppressing fatigue during the hunt. However, nowadays its interest and use go beyond the African continent. The Western societies have become increasingly interested in the plant and its main psychoactive alkaloid ibogaine, especially for its anti-addictive properties proving an extraordinary high success rate and low relapse rate.

This paper will focus on several aspects of the shrub, from its geographical disposition and morphological features, its use in African rituals and near-death experiences to its use, acceptance and legislation in the Western society, medical health-system and authorities as the FDA. Moreover, to have knowledge about its safe and efficient use, ethnic knowledge is essential and should perhaps be adapted into the Western use. Apart from issues as safety is the growing interest and use of the plant a source of the necessity to develop a more efficient and propagative cultivation management, providing an increased amount of the shrub in a sustainable manner. In addition, our varying scientific backgrounds in biology, pharmaceutical science and law, allows us to exploit these different perspectives on Tabernanthe Iboga.

Taxonomy and ecology

Tabernanthe iboga is a plant native of the tropical rainforest in Africa, especially in the West-Central area of the continent. The plant has been identified mainly in Gabon, Cameroon, Congo, Eq.

Guinea, Central Africa republic and Angola (Mahop, Asaha, Ndam & Blackmore, 2000). Moreover, the geographical distribution covers the Congo basin area which concerns the second widest tropical rainforest of the world (Clark & Sunderland, 2004).

Tabernanthe iboga (2n=22) belongs to the family Apocynaceae. The species of this family are known to be poisonous for the amount of alkaloids and glycosides present in mainly the seeds and the latex (Schmelzer & Gurik-Fakim, 2008). Many of them are used as source of medicine, insecticides, fibers and rubber (Schmelzer & Gurik-Fakim, 2008). *Nerium sp.* and *Strophantus sp.*are part of this family (The Plantlist, 2010).

According to the taxonomical classification, the genus Tabernanthe includes 8 species. The species Tabernanthe iboga is supposed to be the most widespread in the genus and the most important in terms of its uses (Mahop et al., 2000; Mahop, Uden, Asaha, Ndam & Sunderland, 2004). Especially the high amount of the indole alkaloid "ibogaine" raised its interest. Though, this is a compound also present, in smaller quantities, in species as *Tabernanthe manii* and in the species, of the near genus, *Tabermontana crassa* (Mahop et al., 2004).

Tabernanthe iboga is classified as a shrub plant of the forest understory and can reach a height up to 4 meters. In particular, riverine forest, swampy soil and wet savanna are its habitat. Morphologically it presents simple, entire and opposite leaves and flowers which are grouped together in an umbel form inflorescence. The fruits are orange colored drupes, occurring in an ovoid form (Mahop et al., 2004; Schmelzer & Gurik-Fakim, 2008). Flowering and fruiting occur during the whole year, with the peak of the phenological activity during the dry season (Mahop et al., 2004). The roots present a brown-yellowish color, turning grey when grinded. The mass of the roots is thick with a diameter of 2-10 centimeters, present just below the ground. Individual roots branch in all direction from this mass differing in length from 50-80 centimeters (Mahop et al., 2004).

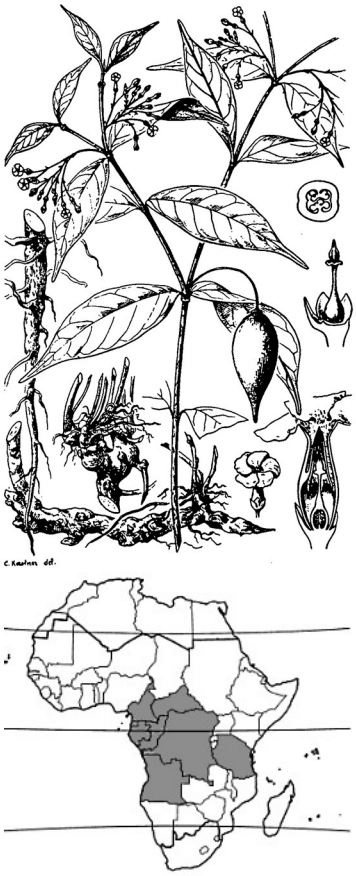


Fig 1: Tabernanthe iboga - geographical distribution

Pollination and breeding of this plant has remained limited studied up to date. Few studies have been conducted to highlight this processes as well as its ways of dispersal. Nevertheless, it has been observed that wild pigs, elephants, gorillas and rodents eat the fruit and the roots of the plant (Mahop et al., 2000; Mahop et al., 2004; Schmelzer & Gurik-Fakim, 2008). Therefore, it is supposed that these animals are involved in the dispersal of the seeds in the wild.

Cultivation and conservation

Locally, leaves and the bark of the stem and the roots are harvested (Mahop et al., 2004). The root bark is the part of the plant with the highest amount of ibogaine and thus the most important in economical trades (Mahop et al., 2004; Schmelzer & Gurik-Fakim, 2008). The bark of the roots is collected in two distinct manners. On one hand, the harvester digs around the plant, exposing the root and peeling off the bark. This way is thought to be moderately sustainable; however, the direct impact on the growth of the plant is unknown. On the other hand, the collection involves the extirpation of the entire plant. In this case, the higher request of this product prompts to maximize the rate of bark collection (Mahop et al., 2000; Mahop et al., 2004). In that respect, the requests from local African people, besides to the increasing Western interests, is pining the necessity to establish valuated manners of propagation, management and conservation of this species in order to avoid the risk of extinction in the wild, due to overexploitation (Mahop et al., 2004). At present, members of the Bwiti religion plant this species around their houses and churches (Schmelzer & Gurik-Fakim, 2008), however, rather few scientific studies have been done and little is known about its domestication and propagation (Mahop et al., 2004).

Fig. 2: roots bark collection and tabernanthe iboga products

The trade of iboga is a worthy aspect for the local economy of Western-central Africa. The products of this plant are sold at local markets, traditional pharmacies and traded between Bwiti members and healers (Schmelzer & Gurik-Fakim, 2008). In addition, Western countries have the possibility to buy the root bark or extract of the principal alkaloid on the internet (Mahop et al., 2004). The increasing benefit from this market stimulates both female and male locals, in a varying age range, to exploit the harvesting (Mahop et al., 2000). Moreover, the market of products of Tabernanthe iboga is closely correlated to the trade of other products as, 'Le Kaolin Blanc', 'Le Kaolin rouge', honey, torch, 'citar' and 'mungongo', used during Bwiti ceremonies (Mahop et al., 2000).

Market at Libreville (Gabon)	**Price**
1 liter bottle of iboga powder	15,000 CFA (US $19.5)
0.05 liter bottle of iboga powder	1000 CFA (US $1.3)

Table 1: Market survey at Libreville (Gabon) (Mahop et al. 2000)

Traditional Africa

Tabernanthe iboga is used as a traditional medicine in the cultures of many inhabitants of West-central Africa. Leaves and bark of the stem and of the roots are consumed independently or mixed with other plants, as *Garcinia cola* or *Enantia chloranta* (Mahop et al., 2004). Moreover, ethnomedicinal studies report the utilization of this plant by gorillas, consuming and exploiting the plant as medicinal resource (Huffman, 2001; Huffman & Vitazkova, 2007). These studies suggest the capacity of these animals to consume the plant in the right dosage as a tonic or in order to have a stimulant effect. The knowledge of the use of iboga is thought to be inherited by the Pygmes of the rainforest of central Africa, who in turn approached this plant observing the different behavior of wild boars eating it (Mahop et al., 2004).

Traditional healers suggest the use of Tabernanthe iboga as treatment for several diseases (Mahop et al., 2000; Schmelzer & Gurik-Fakim, 2008). The decoction of the leaves is involved in curing diarrhea, physical and intellectual asthenia and warmed leaves are use as anesthetic to calm toothache. The bark of the stem and of the roots in different dosages and different mixtures is used to treat fever, stomachache, liver disorders and mental diseases. The latex is exploited either for its anthelmintic properties or mixed with *Periploca nigrescens Afzel.* and/or *Strophanthus spp* as arrow poison (Schmelzer & Gurik-Fakim, 2008). Locally, the plant is given to people addicted to mbanga (*Cannabis sativa*) and afofo, a local alcoholic drink made from distillated palm wine (Mahop et al., 2004). Furthermore, Taberanthe iboga is advised to understand the cause and the consequent cure for women suffering infertility and impotent men. In addition, children consume it, as it is thought to enforce the immunity system. Some local healers even claim its beneficial properties as treatment for AIDS (Mahop et al., 2000; Mahop et al., 2004).

Scientifically, however, this has yet to be estimated and tested in order to provide empirical evidence for its mechanisms of action and the effects of mixtures of alkaloids present in the plant. Nevertheless, field studies report the daily consumption of the root bark as stimulant and tonic. Both fishermen and hunters benefit of its energizing and sensory amplifying effects to enhance their performance and overpass the fatigue during their work (Fernandez, 1982). In the past, German colonists allowed their African workers to continue the use of iboga during the construction of a rail line network (Fernandez, 1982).

Fig 3: Bwiti rituals

The highest amount of root bark is consumed during the ritual ceremonies of initiation to Bwiti religion (Fernandez, 1982; Schultes, 1970). This practice occurs once, maximum twice during the whole life of a person. In Bwiti religion the intimate relation with iboga is of fundamental importance to experience and understand the knowledge and the tradition of their culture (Mahop et al., 2000;

Mahop et al., 2004). The initiate person is confided to a 'mother', who is an experienced man with regard to the use of iboga and the ceremonies. The task of the mother is to regulate the dosage of iboga, observing the latest physiological reaction. In that respect, the heart beat, temperature and the sensitivity reaction are continually monitored. Usually, the whole village participates to the ceremonies. The participants paint their faces and dress traditional costumes. During the ceremonies musical instruments are played to induce the ricing of hallucinations (Mahop et al., 2004).

During the initiation ceremony, the initiate person undergoes a stage of communication with the ancestors of their culture and arrives in a state of deep feeling and connection with the past, the present life experience and future behavior (Strubelt, 2008). Many tribes of West-central Africa pursue this tradition, though differences with respect to rules and context occur. In some tribes women and children are excluded from consumption, moreover, the kind of vision, though similar, can differ depending on cultural influences, such as merging of Bwiti culture with Christian religion (Schmelzer & Gurik-Fakim, 2008).

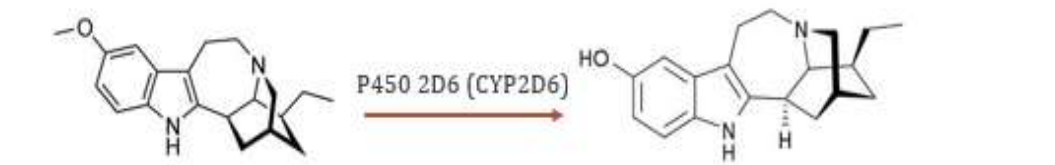
The Iboga Alkaloid: Ibogaine

The bark of the root of Tabernanthe iboga contains about 12 alkaloids of which ibogaine, a tryptamine derivative, is the best known iboga alkaloid which has a total alkaloid content is 5-6 % in dried root bark (Bowen, 2001, Mash et al., 2001).

Moreover, based on experimental data from animals and individual reports in human, it has been found that this drug has anti-addictive effects. The pharmacology of ibogaine is quite complex since it affects many different neurotransmitter systems simultaneously. However, the pharmacological targets underlying the psychological actions of ibogaine are not completely understood. Ibogaine is not approved by the Food drug administration (FDA) or the European medicine agents (EMA) since there is no clinical evidence for the efficacy and safety of Ibogaine.

Working mechanisms ibogaine

Ibogaine, like many other CNS drugs, is highly lipophilic and is subject to extensive biotransformation (Bowen, 2001, Mash et al., 2001). Ibogaine is rapidly metabolized after ingestion into noribogaine by demethylation of ibogaine at the methoxygroup by cytochrome P4502D6 (CYP2D6) in the liver (Mash et al., 2001) and in the brain



ibogaine (12-methoxyibogamine) noribogaine (12-hydroxyibogamine)

(Miksys et al., 2002). It has been purposed that noribogaine may selectively mediate putative anti-addictive effects that continue for prolonged periods of time, since the metabolite stays in plasma for at least 24 hours after oral ibogaine administration (Mash et al., 2001).

Pharmacodynamics, mechanism of action and the side effects related to Ibogaine

Fig.4: Catalyzation of Ibogaine into noribogaine in either liver or brain by enzyme group cytochrome P450 (CP450).

Several reviews have identified the pharmacological profile of ibogaine. It has been shown that ibogaine and noribogaine interact with multiple binding sites within the central nervous system (CNS), including N-methyl-D-aspartate (NMDA) receptor coupled ion channels, K-opioid (K1 and K2), μ-opioid and σ2- serotonin (5-HT2 and 5-HT3), Muscarinic (M, and M2) receptors and monoamine uptake sites, and nicotinic acetylcholine receptors. Evidence suggests that ibogaine treatment might result in the "resetting" or "normalization" of these receptors which consequently lead to withdrawal symptoms (Alper, 2001; Mash et al., 2001).

Moreover, Ibogaine's efficacy has been investigated during preclinical development. There has been evidence for ibogaine's effectiveness in animal models where the reductions in self-administration of morphine, heroin, cocaine, alcohol and many other addictions were investigated. In studies with cocaine, the self-administration has been reduced, which persisted for approximately 48 hours with no drug dependence (Alper, 2001; Mash et al., 2001).

Additionally, several safety studies have been performed during preclinical development. These studies raised several safety concerns, mainly neurotoxicity and possible cardiotoxicity. Multiple studies have reported on the degeneration of cerebellar Purkinje cells in rat receiving i.p. administration of ibogaine at a dose of 40-100 mg/kg (Alper, 2001; Bowen, 2001; Mačiulaitis, Kontrimavičiūtė, Bresolle, & Briedis, 2008; Paling, Andrew, Valk & Blom, 2012). However, the neurotoxic effects of ibogaine may occur at levels higher than observed effective dose levels. In addition, animal studies showed certain dose depended cardiotoxicity which could lead to decreased heart rate without an effect on blood pressure (Alper, 2001; Mash et al., 2001; Mačiulaitis et al., 2008; Bowen, 2001; Paling et al., 2012). Ibogaine, like many other drugs that are metabolized by CYP2D6, may increase the QT interval of the heart which can lead to heart disorder. Foods such as grapefruit are also metabolized by this enzyme, have the same effect on the QT interval, and may increase the risk of heart failure during the treatment. Therefore, Ibogaine alone and in combination with other foods that are metabolized by CYP2D6 should be avoided for patients with high risk of heart failure (Alper, 2001; Mash et al., 2001).

Case studies of Iboga treatment indicate several physiologic effects that are related to Iboga treatment. One of the first noticeable effects after Iboga treatment is ataxia, a difficulty in coordinating muscle motion which makes standing and walking difficult without assistance (Alper, 2001). In addition, many users of ibogaine reports experiencing visual hallucinogenic phenomena during a waking dream state (Strubelt, 2008). The hallucinogenic experiences of Iboga various for each individual, where they have no recollection of the reality. Other, side effects that may follow are xerostomia (dry mouth), nausea and vomiting that might range from 4 to 24 hours in individuals (Alper, 2001; Mash et al., 2000).

However, despite of the risks associated with ibogaine, this drug is well-established among addicts which has led to informal treatment networks in Europe and the United States (Alper, 2001).

A personal experience of an Iboga user during wakening dream state of mind, taken from the Ibogafoundation forum:

"…I spend god knows how long time, just dancing and playing with my hand and enjoying the traces left behind. I felt myself so light and my movement were so airily, that I couldn't get enough……My brain was thinking with the speed of light and I had hard time picking things out……And then this pyramid started to fall apart from the top, on trillion and trillions small pieces, until it became a chaos….I desperately needed something to drag me out of this fear of being absolutely alone with the incredible force of the bark, that was heading me back to the dawn of creation…….I did not sleep at all that night- I was in this half-asleep state of mind, a lucidity. Certain memories from my childhood flashed through my yes, but trying to recall them, feels like trying to remember a forgotten dream……. The next day, I felt the urge of going outside, and the minute I walked out of the door and felt the fresh winter air filling my lungs, I felt like I was part of everything, of the entire world, as I knew it…..'' (www.ibogafoundation.com)

Legal

The legal status on Tabernanthe iboga differs from country to country. In Gabon iboga is considered as a national natural heritage and sacred plant. In the western world the plant is often banned. The legal status is complicated due to different views on the plant.

In this paragraph only the countries and institutions where iboga is a topic will be mentioned.

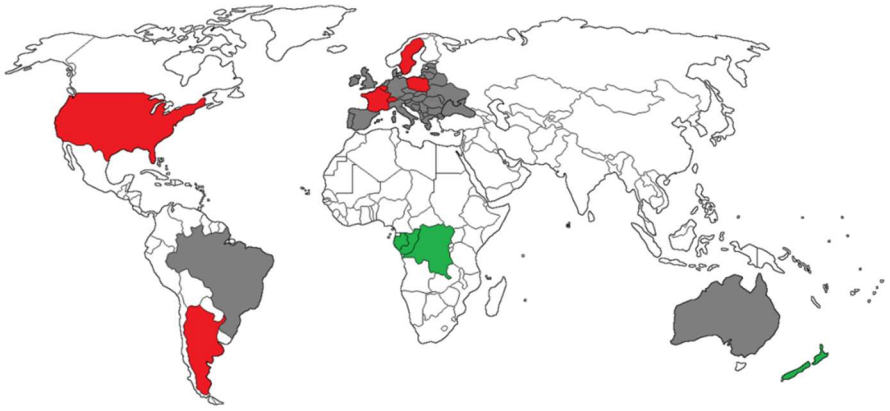


Fig. 5: legality of ibogaine worldwide; red: illegal, grey: semi-legal green: legal

United Nations

The United Nations International Narcotics Control Board (INCB) has published on their website their annual report about the world situation on drugs in 2010 (INCB, annual report 2010). In this report, the INCB has included the preoccupying recommendation towards governments to outlaw traditional plants such as Tabernanthe iboga. The board does not mention iboga's important role as traditional medicine, as a sacrament and as therapeutic tool.

European Union

In approximately half of the European country's iboga is not scheduled. This means that it is not illegal to have but it is neither recognized as a medicine. However, in 2004 the European Union introduced the European Directive on Traditional Herbal Medicinal Products. Under their authority all herbal medicinal products are required to obtain an authorization to market within the EU. Only very few medicinal plants are registered, and iboga is not. Therefore, iboga is not allowed to be used medicinally. The use of iboga for non-medicinal use is not regulated in the European Union.

Some European Union countries have registered iboga as an illegal substance. This concerns the following countries: Sweden (ibogaine.se), Denmark, Poland, Belgium, France and Switzerland.

United States of America & Canada

In the 1970's, with the passage of the Controlled Substances Act in the USA, ibogaine became classified as a Schedule I-controlled substance (Federal Food, Drug, and Cosmetic Act). Ibogaine is uncontrolled in Canada. Though not approved by the health authorities, ibogaine is not a prohibited product under the Controlled Drugs and Substances Act.

Australia and New Zealand

Ibogaine may be illegal to possess & sell in Australia, but it does not appear to be listed in the controlled substances lists. It is illegal to import iboga into Australia without a license, it is "Schedule IV" in the import laws (AU Import Regulations).

Although Ibogaine is not an approved drug in New Zealand, it was gazetted as a prescription medicine under the Medicines Act in 2010. This allows registered medical practitioners to prescribe unapproved medicines for the treatment of patients in their care. New Zealand has a leading role in the regulation of iboga and should be an example for the safe medicinal use of ibogaine.

Central and South America

Many treatment centers have been set up in Costa Rica and Mexico. United States citizens are willing to travel to treat their various addictions. Only in Brasil the import of iboga is prohibited due to bio-piracy laws. In Argentina ibogaine recently became an illegal scheduled drug (lista especial IV).

West Central Africa

Since iboga has been part of culture in Gabon, Cameroon and Congo it is accepted to use as a medicine (Mahop et al., 2004). Since iboga has become more popular the exploitation has been growing. Gabon made export illegal, however the Gabonese go into the virgin forest and cut down old grown iboga trees with frightening regularity. The roots are then smuggled to Cameroon and sold for great profits. This over exploitation is becoming a serious threat to the existence of iboga.

Western use as a therapeutic treatment

As stated before ibogaine has serious effects on the mental and physical state. Its anti-addictive properties have become accustomed in the western alternative health care system. Although the official medical society and the authorities have no trust in the iboga treatment, an overwhelming amount of anecdotal reports on the internet show the great health benefits that iboga provides (Sisko, 1993; Lotsof, 1995; Luciano, della Sera & Jethmal, 2000).

History

In the western world ibogaine was first introduced as a medicine. It got introduced to the public in France from 1939 till 1970 and sold as an extract in 8 mg tablets, called Lambarene (Goutarel 1993).

In the 1960´s Howard Lotsof (1943-2010) from New York city, then a heroin addict, by accidentally found out the anti-adictive effects of ibogaine. Howard was cured from his addiction and became most active in promoting the use of ibogaine.

Psychological effects

Iboga treatment has a lot of potential as a psychotherapy. Studies have shown many other psychological problems can be successfully treated (Bastiaans, 2004). Doing an iboga session with the intent to get insights can help psychological and emotional processing.

Ibogaine allows the brain to enter a waking REM state where memories; life experiences; and issues of trauma are processed in a subjective manner (Goutarel, Gollnhofer & Sillans, 1993; Strubelt, 2008). The iboga overwhelms the system psychologically and emotionally, sometimes with visions, feeling like a rhythm that is taking over, while the brain is getting restructured(Strubelt, 2008). Certain patterns in negative thinking, destructive behavioural patterns, coping mechanisms or compulsive behaviors can be interrupted. From the subconscious and super conscious mind the iboga brings insights that can help to overcome stress from traumatic experiences (Iboga Foundation).

Since trauma is cause of many mental problems, such as depression, posttraumatic stress and more, iboga can be a successful tool to treat these psychological problems.

A quote from a medical study (Bastiaans, 2004):

'The participants reported major changes in their quality of life, especially in the following aspects: medical condition (58% reported a health improvement since the treatment), social functioning (88% claimed that they experienced a significant improvement), psychological well-being (significant improvement especially in anxiety and depression) and relationship with the law (one third of the participants reduced or ceased their criminal behavior).'

Anecdotes from the Iboga Foundation internet forum:

'Someone mentioned 'Iboga took the monkey off his back.

When I had received the maximum dose, I actually saw that monkey, one of the several moments I woke up. It was sitting on the cabinet facing my bed in a vision that was so lucid. I'd hung my bag on one of the doors and the monkey looked at me hostile while it was trying to grab things out of my belongings. It was so real that I crawled towards it, to punch it in the face. Suddenly it was gone... Later I understood the meaning.'

'In addition to sugar, I was addicted to nicotine. First diagnosed with depression in 1995, I'd also been taking SSRIs continuously for the past 16 years. I underwent ibogaine therapy in December 2010 and am thrilled and encouraged by the results. I am not craving sweets. I've cut back on smoking and feel encouraged that I will be able to quit soon. Perhaps best of all, I haven't taken my antidepressant medication

in over 3 weeks, with no ill effects. I feel strong, powerful and energetic. Food tastes better and I savor it more. Trips to the grocery store are objective rather than emotional. My brain fog has lifted and I feel much more alert, confident and capable.'

Addiction interruption

The most studied long-term therapeutic effect is that ibogaine seems to catalyze the complete interruption of addiction to opioids. An integral effect is the alleviation of symptoms of opioid withdrawal. Ibogaine has proven itself to be an effective treatment for any sort of addiction. Ibogaine affects both physical addiction and the compulsive behavioral patterns not involving substance abuse or chemical dependence (Glick, Rossman, Rao, Maisonneuve & Carlson, 1992; Alper, 2001, Mash et al, 2001). Iboga has three main effects that makes it a remarkable addiction interrupter;

- A massive reduction in the symptoms of drug withdrawal
- Lowering in the desire to use drugs for a significant period of time
- Helpful to understand and resolve the issues behind the addictive behavior

Often users of ibogaine report that they were experiencing visual phenomena during the waking dream state, such as instructive replays of life events that led to their addiction, while others report therapeutic shamanic visions that help them conquer the fears and negative emotions that might drive their addiction. Ibogaine is a "remogen" referring to the REM or Rapid Eye Movement normally occurring for brief periods of time during the sleep/dream state. Ibogaine catalyzes this state of REM for hours while fully conscious and aware so that memories; life experiences; and issues of trauma can be processed in a subjective manner (Goutarel et al., 1993).

Risks involved with today's treatment

Iboga is a very serious substance. If taken irresponsible, there are many risks involved. Because there is hardly any regulations on the treatment providers, there are many things that can go wrong. In the past years there have been several fatalities, which mostly have to do with the irresponsibility of the providers (Alper, Stajić & Gill, 2012; Paling et al., 2012). Providers are not always able to provide the medical care that people with already instable health requires. A screening of the client's health is important. Another issue is that anyone can call themself a provider. At the moment addicts are treating each other, without any clue about dosing and no idea about medical health.

Iboga is very harsh on the body, therefor it is important the person is in a healthy physical state. Not being able to eat for a day or sometimes two, for some is that too much to be dealt with. Most people seeking ibogaine treatment are addicts who have a bad health. Iboga could save their life from addiction but could be a health hazard itself for them. Overdosing could be fatal, while under dosing is might not stop their withdrawal symptoms. Another risk is that iboga is taken in conjunction with other

substances like alcohol, opioids, or other drugs. Mixing iboga with other substances often leads to heart failure and can be fatal (Paling et al., 2012).

Controversy

There is a big controversy surrounding iboga. It sounds too good to be true, a plant that breaks all sorts of addictions, depression, and many other health issues. Then the question raises; why is it not widely available or at least known by the public?

There are several reasons why iboga is not known and still not accepted in the Western world. First of all, we live in a capitalist system where medications are linked with profits that need to be made. It costs enormous amounts of money to research medication. And only well researched medication will be marketed. The money invested in research can only be earned back by putting patents on the medications. Since iboga is a plant, it cannot be patented. Therefore, little money can be made to bring it on the market. To offer iboga commercially will not bring great profits, because it is a plant. Tabernanthe iboga needs to be cared for with water, the right soil and sunlight. Research cannot be funded by the commercial sale of a plant. Usually pharmaceutical companies make money on maintenance drugs. Iboga is the opposite of that. It is very unadvisable and probably not even possible to take iboga on a regular base as the effects are strong and overwhelming.

Another issue is that hallucinogens are a taboo in western society. Hallucinogens are not accepted and certainly not as any form of medication.

Other obstacles are safety and side effects. Only in West-Central Africa and New Zealand a doctor is permitted to prescribe Iboga treatment. Therefore, iboga treatment is practiced in a non-medical setting. This often goes well, however, a medical setting, with the right medical staff could offer much safer treatments for the ones who mostly need it. Addicts often are unhealthy people and have great health risks even without taking Iboga.

Personal experience with iboga

Growing up I lived in a house where iboga treatments were part of daily my life. My mum Sara Glatt started to offer treatment in our family house to people with various backgrounds. I have met young fashion models and famous musicians addicted to cocaine, severely depressed people, people with war and sexual abuse trauma, people with eating disorders and many heroin and methadone addicts who have been living of the streets. I grew into understanding several issues these people have been dealing with and saw them undergoing iboga treatment. At a certain point I started to help by offering emotional comfort, preparing food and caring for the people during the treatments.

Most people come in, not knowing exactly what to expect. These days youtube is full with anecdotes so that people can somehow prepare themselves on what to expect. After informing them what to expect and how to prepare the treatment could get started. With addicts it in necessary to wait until the withdrawal symptoms start. First a test dose is taken to be sure there will be no allergic reaction. After 45 minutes to one and a half hour later the full dose would be taken. The dosage would be depending on many different factors. For example, the weights, sort of addiction, experience with hallucinogenics, if someone is a bit scared or not, etc. This requires a lot of knowledge of the client's background and on how the iboga works.

When iboga starts to work, the person often starts hearing some buzzing energy and seeing electricity going through the air. After an hour the iboga starts to really kick in and the person feels that he or she would need to lie down. Concentrating on anything will be impossible, and their senses will get much stronger. Therefor a bed in a dark room with the least possible stimuli is preferred. Depending on how the person feels my mum used to stay with them or would check every 10 to 15 minutes for the first hour. During the first 4 hours the energy of the iboga can be felt very strongly. Toxins will be released by sweating and often also by vomiting or diarrhea. During this period there is a strong sense of ataxia and are the patients unable to go to the bathroom on their own. Some people though try to, but look like drunken seaman on a ship in a sea storm. The nausea gets stronger when people move around. Lying still in bed is the best advice. To keep the person hydrated, water is frequently offered.

After a few hours the iboga starts to wear off. The person is usually exhausted, from all the emotions, visions, thoughts, and ideas that have come up during the treatment. It often feels like getting of a mental rollercoaster. A few days of rest and processing are needed before all the energy levels are back to normal.

I have taken iboga myself to experience how it works. I experimented with iboga root bark. I have taken low dosages for a few days. The only effect that I felt was that I had serious concentration problems. It was hard for me to follow classes and focus on my studies. More than two years ago I have taken a flood dose of iboga root bark. I took about 25 capsules of raw bark. This was a lot for my stomach. It felt like my stomach was filled with sand. The experience lasted the whole night. I didn't have any visions but did experience the dream like state. I felt the energy of the iboga very strong and was going through the experience with many thoughts about my personal life. I feel that this experience has helped me to have a stronger idea about who I am.

In 2010 I started the Iboga Foundation. I felt that this was needed to inform others about the great health benefits and to develop iboga treatment as a serious therapeutic tool. The foundation is present in the social media and has grown to be a known platform for anyone who wants to know more about iboga. The potential for the foundation is great, since there is much work to be done. The development of ecological responsible harvesting is becoming a bigger responsibility for iboga community. On the

other hand the demand for iboga addiction treatment is growing increasingly. These are matters the foundation will need to deal with and help to find a balance in.

Conclusion

Tabernanthe iboga has an important socio-economical value in Gabon and in the surrounding African regions, as it is associated with the Biwiti culture and ceremonies. The extraordinary curative properties of the plant have increased interests by Western countries as it is involved in anti-addictive therapies. As a consequence, the exploitation of the root bark or the extract of the active principle ibogaine is prompting a rising economical trade from African people to Western countries. On the other hand, many plants are drastically up rooted and collected from the wild to maximize the commercialization.

Therefore, ecologic studies and manners of propagation of the plant should be considered. The sustainable way of harvesting and domestication might bring about both the conservation of natural systems and the development of a profitable economy in West-Central Africa. This potential could be increased even further whenever ibogaine would become the mainstream anti-addictive treatment. Despite the increasing interest in ibogaine, concerns about its safety, economic and political constrains, and legal controversies over intellectual right are hampering its development.

In addition, pharmaceutical studies should be directed to focus on the beneficial properties of this plant and ethnobotanical observation should spin the way of approaching and pattern-interpretation-reformulation in Western context. In that respect, the planning of an adequate after-care program should be considered, and the problem of drugs addiction should be analysed deeper within the urban socio-cultural environment. Scientific experimental studies have been conducted to unravel the action mechanisms and effective working of ibogaine in anti-addictive treatments. Ibogaine could represent a unique approach for the treatment of addiction since it is able to ‘’reset’’ the neural pathways and the behaviour phenomena that results from various types of CNS disorders and addictions; nonetheless, the manifestation of controversial side-effects has yet to be explained. Nevertheless, personal experiences of iboga and animal experiments have provided evidence for the effectiveness of Iboga and the tolerability of the Iboga related side effects.

Moreover, iboga and ibogaine are regulated by a fuzzy and controversial legislation through the world, complicating future research. Legalization of iboga for the use in clinical practice could provide a major step forward in the treatment of addiction since current rehabilitation programs are less effective and have higher chance of relapse. In addition, there is high amount of effort and time needed until the patient is ‘’clean’’. Therefore, further investigation is warranted in relation to the efficacy and safety to legalize Iboga for the treatment of several CNS disorders and addiction.

To conclude, whenever ibogaine is treated in a sustainable way, such demand could offer an important economical income for forest dwellers in preference to other destructive forest activities such as logging and commercial hunting. Besides, the plant could be of scientific and social interest for research and innovative technologies for the human well-being and fare-trade understanding and management.

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