

South American Indigenous Knowledge of Psychotropics

The Need for Culturally Adapted Intellectual Property Rights

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Abstract

Indigenous people have contributed greatly to the advancement of science with their knowledge of medicine. Unfortunately they have not received appropriate recognition for it. Intellectual property rights of indigenous people in this field have been neglected, and current intellectual property laws make it nearly impossible for indigenous people to claim property over their knowledge. It is here demonstrated that the status quo regarding intellectual property laws is not acceptable. Three study cases are put forward as examples in which the intellectual property rights of indigenous people have been grossly overlooked. The text concludes by suggesting the gains that would ensue from modified and improved laws in this regard for society at large.

4.1 INTRODUCTION

Regardless of whether Western medicine and indigenous medicine work together voluntarily or not, the knowledge exchange between them has had important impacts. In 1990, worldwide sales of all pharmaceuticals amounted to \$130 billion, \$32 billion of which was based upon indigenous medicines (Lassonde, 2003). Plants are an important part of indigenous medicine, and also of Western medicine. Prescriptions given in US pharmacies from 1959 to 1980 were analyzed, and it was found that 25% of these contained plant extracts or derivatives and also contained at least 119 chemical substances from 90 plant species. Moreover, 74% of these drugs were the result of isolating active substances from plants used by indigenous people (Gurib-Fakim, 2006).

For example, local anesthesia was first made possible with the psychotropic cocaine, derived from the coca leaves used by South American indigenous people. Malarial fevers could finally be appeased thanks to the quinine found in cinchona bark used by the Incans of

the Andes. Inducing muscle paralysis in surgery was at last feasible with curare, used as a muscle relaxant by South American indigenous peoples. Breast cancer treatments were improved tremendously with the advent of tamoxifen,¹ an active ingredient of the Pacific yew *Taxus* used by the Nuxálk Nation [Bella Coola tribe] of British Columbia (Canada) for lung ailments (Gurib-Fakim, 2006).

Historically, little or no recognition has been given to the indigenous people for the contribution their knowledge has made to the advance of Western medicine. Yet thanks to the indigenous medicinal knowledge passed down from one generation of healers to the next, Western scientists were able to work directly on relevant plants, and did not have to go through the long trial-and-error process of trying to find a plant useful to the treatment of a given disease. Shaman Pharmaceutical, for example was based on this fact: consulting indigenous peoples, bio-prospectors can increase their success ratio from 1 out of 10 000 to 1 out of 2 (Bierer, Carlson and King, 2006). They worked closely with indigenous healers to identify plants of medicinal use. This eliminated the need to test tens of thousands of plant species; they were able to focus on chemically separating the active ingredient of the plants, and understanding the chemical structure of this entity.

This chapter aims to demonstrate that indigenous peoples' knowledge in general and indigenous healers' medicinal knowledge in particular needs to be given recognition as an important human achievement. According to the United Nations Development Program and the World Trade Organization, 80% of the world's population depends on indigenous knowledge to meet their medicinal needs (Lassonde, 2003). Acknowledgement of indigenous peoples' contributions to mankind should also take an appropriate legal form. This would ensure that indigenous peoples' knowledge is not exploited, that indigenous people retain ownership of their collective knowledge, and that they receive proper compensation for others' use of that cultural knowledge. This has not yet been achieved.

Current intellectual property laws are modeled after Western philosophy's concept of property rights. Using currently accepted intellectual property laws, it is nearly impossible for indigenous peoples to argue for legal recognition of their intellectual property rights over their culturally-shared medicinal knowledge.

This chapter will first define important terms, and then describe three specific examples of indigenous medicinal knowledge – quinine, coca and ayahuasca, two of which (coca and ayahuasca) have known psychotropic properties. The second part of this chapter will deal with the legal aspects of indigenous intellectual property rights in general and indigenous medicinal knowledge in particular. Current intellectual property laws will be described, as well as how they become problematic when dealing with indigenous healers' medicinal knowledge. Reasons why legal and economical recognition of indigenous peoples' knowledge have not been achieved will be presented. The intellectual property rights problems pertaining to the three examples of indigenous medicinal knowledge (quinine, coca and ayahuasca) will then be illustrated. The chapter will conclude with a discussion of both the general benefits that recognition of indigenous healers' medicinal knowledge would bring to mankind, and the specific benefits it would bring to the indigenous peoples concerned.

4.2 DEFINITIONS

4.2.1 Indigenous People

Various definitions for the term 'indigenous' exist. In the following text, we will use the working definition of the United Nations Working Group on Indigenous Populations.

Indigenous populations are composed of existing descendents of the people who originally inhabited the present territory of a country (or countries), wholly or partially, at the time when persons of a different culture or ethnic origin arrived there from other parts of the world and overcame them, either by direct conquest, settlement, or other means, and reduced them to a non-dominant group within their home regions or territory (Swazo, 2005).

It must be stressed that this is only a working definition. We believe that the identity of an indigenous person should not depend on the presence of a history of colonization and non-dominance.

4.2.2 Indigenous Knowledge

By indigenous knowledge, we mean any and all knowledge held individually or collectively by members of indigenous populations. Beyond this definition, indigenous knowledge is described by many as knowledge directly functional in long-term survival of a specific group of people.

In this text, we refer specifically to one type of indigenous knowledge, that is indigenous medicinal knowledge. The term indigenous medicinal knowledge will be used here as a synonym for traditional medicine, as defined by the World Health Organization in 2000:

...the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health, as well as in the prevention, diagnosis, improvement or treatment of physical and mental illnesses (WHO, 2000).

4.3 THREE INDIGENOUS PEOPLES' MEDICINAL PLANTS: QUININE, COCA AND AYAHUASCA

The indigenous people of the South American continent have contributed to the advancement of the sciences and the arts in multiple ways. Among them are many of the world's staple foods as well as numerous medicinal plants. For instance, potatoes, maize, beans, tomatoes, cacao, peanuts and yams were all selectively cultivated and consumed by South American indigenous peoples prior to the arrival of Europeans. Also, medicinal plants such as American ginseng, golden seal, quinine, ayahuasca, curare and coca have played an important role in Western medical treatments (Forbes, 1997). Yet there currently exists no form of recognition of, or remuneration to indigenous peoples for their knowledge of the agricultural and medical uses of these plants.

We here give a brief description of the traditional and current uses by indigenous people of three specific plants.

4.3.1 Quinine

Traditional Use

Quinine is the alkaloid found in the bark of cinchona (also called quinaquina) trees, constituting an important anti malarial drug. The tree is native to the Andes, found from

Venezuela to Bolivia. Quinine from cinchona bark was used to treat malarial symptoms before the disease was identified in Western medicine (Gilani and Atta ur, 2005). The Incas knew it was effective in the treatment of muscle aches and fever. Their use of quinine was an empirical one (Kaufman and Rúveda, 2005). Quinine was known and used by indigenous people of the Andes for centuries before the arrival of Europeans (AGN, 1931).

Current Use

Quinine is still among the most effective anti-malarial treatments (Meshnick, 1997). Synthetic drugs are now also used (such as Chloroquine and Mefloquine), but these can cause serious side effects, and also resistance is developed, and thus quinine remains a preferred treatment in many cases.

4.3.2 Coca

Traditional Use

Coca, from the plant *Erythroxylum coca* var. *coca* and *Erythroxylum novogranatense* var. *truxillense*, has been used by the indigenous peoples of the highlands of South America for more than 2000 years (Sgan, 1998). Pre-Columbian use of coca was common. Its use is reflected in ceramics and figurines found in archeological sites in Venezuela, Colombia, Bolivia, Ecuador, Peru, Chile and Argentina. Using radioimmunoassay and gas chromatography/mass spectrometry, coca has been detected in mummies from Peru, Bolivia and Chile. The earliest detection of coca was made in two Alto Ramirez mummies from Northern Chile. Carbon-14 dating determined them to be from 2900 to 2700 years BP (before present.) (Rivera *et al.*, 2005).

The traditional Incan uses of coca were mainly health-related. It was used by healers directly on the cranial wound during trepanation² as a local anesthetic (Sgan, 1998). It was also used in powder or plaster form on skin ulcers and wounds. In addition, it was used to manage pain. It was infused in tea to appease gastrointestinal pains and it was chewed to relieve toothache, sore throat and abdominal pain. It was used as a means to preserve strength, curb hunger and mask thirst. Coca was also used in religious rituals.

When the Spaniards came to South America, they added to the uses of coca, giving daily doses of coca to Incan laborers as a means of increasing their work output. Today, coca chewing is common among impoverished highland peasants of South America (Naranjo, 1981).

Current Use

In the medical field, coca has proven extremely useful. Because of cocaine's rapid absorption across mucous membranes, otolaryngologists use cocaine during surgery as an anesthetic, and as a vasoconstrictor of nasal and laryngeal mucous membranes. Cocaine is also used as local anesthetic during endoscopies and in ophthalmology, to determine the presence of Horner's syndrome (Sgan, 1998).

4.3.3 Ayahuasca

Traditional Use

Traditional use of the plant Ayahuasca (Quichua term for ‘vine of the evils’) goes back thousands of years. Until today, the beverage made from Ayahuasca was used in religious rituals for its hallucinogenic properties. Use of Ayahuasca has its origin among the Quichua of the Amazon Basin (McKenna, 2004). It has been used to diagnose illnesses, to aid in prophecies, as a preventive measure against evil-doers, to train traditional healers, and to achieve religious ecstasy (de Rios and Grob, 2005).

Ayahuasca is a beverage made from the mixture of two plant species of *Banisteriopsis caapi* and *Psychotria viridis*. The hallucinogenic properties of Ayahuasca are due to the reversible inhibitors of type-A monoamine oxidase (MAO) such as harmine and harmaline, contained in *Banisteriopsis caapi*, which, by inhibiting the type-A MAO, allow the activity of *N, N-dimethyltryptamine* contained in the leaves of *Psychotria viridis* (Callaway *et al.*, 1999). Ayahuasca’s hallucinogenic properties cause dream-like states, as well as enhanced introspective attention. Physiological effects of Ayahuasca include nausea, increased heart rate, increased frontal and paralimbic activation (Riba *et al.*, 2006), and an increased number of binding sites in the platelets of regular Ayahuasca drinkers (Callaway *et al.*, 1994). More precisely, *N, N-dimethyltryptamine* and the type-A MAO increase central and peripheral serotonergic activity and facilitate *N, N-dimethyltryptamine* activity (Callaway *et al.*, 1999).

Current Use

Today, Quichua traditional healers in the Amazon Basin continue to use the Ayahuasca in their religious and healing ceremonies. The concoction is only used under a healer’s supervision. The drink has profound religious significance for the indigenous people concerned. However, use has now spread to mestizo³ groups of Ecuador, Peru, Venezuela, Colombia and Brazil. There is also today confirmed use of Ayahuasca as a hallucinogenic in Spain and the United States (de Rios and Grob, 2005).

4.4 LEGAL ISSUES

4.4.1 Current Situation

Respect for intellectual property is of primordial importance in Western society, both in the arts and the sciences. Intellectual property rights are conceptualized as protecting due ownership rights of those concerned, but also, perhaps most critically, to promote the development of new ideas, inventions and discoveries (Fecteau, 2001), by providing recognition and ownership rights to those who contribute to the advancement of the sciences or the arts.

Current Western intellectual property rights firmly base their eligibility criteria on the logic of Locke and Hettinger. John Locke, an English empiricist philosopher, considered

individuals to have property rights over knowledge to which they had contributed labor and effort. Hettinger, a contemporary philosopher, views the implementation of intellectual property rights as necessary in cases in which such rights promote further intellectual outputs (Townley, 2002). These ideologies advocate assigning intellectual property rights on medicinal knowledge of indigenous people to Western scientists based on the following reasoning: since the Western scientist put labor into understanding the traditional indigenous knowledge, and, that prior to this effort, the traditional knowledge was unknown to Western society, then, the Western scientist has indeed contributed a new form of knowledge to which he is entitled ownership.

A variety of legal concepts exist to protect and/or recognize intellectual property rights. They include trade secrets, patents, sui generis systems, customary laws, tailor-made contracts and specific protective laws, such as the Plant Variety Protection laws (Timmermans, 2003). The most influential in matters of intellectual property rights is the patent system.

The patent system works very well within Western society. Indeed, its purpose and requirements fit well with the nature of Western science and art. It recognizes and rewards individuals for new, unique work, never before seen in one's country, nor published elsewhere. It works very well to grant intellectual property rights to holders of Western scientific knowledge. The purpose of patents is 'to promote the progress of science and useful arts' (Fecteau, 2001). The patent system achieves this by granting the patent applicant exclusive commercial rights over his invention or discovery for a fixed period of time. In return, he must disclose the invention/discovery. By restricting the short-term access to inventions/discoveries and granting individual applicants temporal ownership of the inventions/discoveries, the patent system functions as an incentive to further invention and discovery. In the long-term, the patent system contributes to the progress of society by providing a database where discoveries and inventions are registered.

Patent Criteria

Patents function within the borders of a sovereign nation. In this chapter, we limit our review to US laws. Patents must be acquired within each country in which intellectual property rights are desired for a particular invention or discovery (X). In the United States, X must meet three criteria in order to be granted a patent by the US Patent Office: (i) novelty, (ii) non-obviousness and (iii) utility.

The novelty criterion requires X to be new. This means that there must be no prior art involving X. US Patent law recognizes four possible types of prior art: (i) prior knowledge of X in the United States, (ii) prior use of X in the United States, (iii) prior patent of X in any country and (iv) printed publication of X in any country (Fecteau, 2001). Importantly, foreign prior use or knowledge is not recognized as prior art, unless its use or knowledge is published prior to patent request in the United States.

The non-obviousness criterion requires that X not be obvious to someone with ordinary skill in the particular art. Here too, obviousness to a person in a foreign country is not deemed relevant, and does not impede granting of patent in the United States. It must be noted, further, that just what constitutes 'a skill in the particular art' is often interpreted narrowly. Thus, for example a healer's knowledge of a medicinal plant and its beneficial effects will not necessarily be considered to be prior art to the knowledge of the chemical

composition of the active components in the medicinal plant, even though the former was essential to the determination of the latter (Wiser, 1999). As will be seen in the following section, this puts indigenous healers' medicinal knowledge in an evident position of disadvantage, making it difficult to defend indigenous intellectual property rights and to fight patents over plants requested by scientists and companies.

The utility criterion requires X to be useful. This criterion is rarely a problem for patent applicants. The concept of utility is broadly interpreted, and truly only demands that the discovery or invention have at least some kind of trivial use, and that it cause no harm; that is that it have no illegal or immoral purpose.

Problematic Aspects of Indigenous Medicinal Knowledge Under Current Intellectual Property Rights

Indigenous knowledge, as defined earlier in the chapter, is most often communal, intra- and inter-generational, often subjective, directly functional in long-term survival, and usually transmitted through oral tradition among indigenous healers (Dutfield, 2001). It involves biodiversity, for the knowledge is often of animals and medicinal plants. For these reasons, many have come to consider indigenous healers' medicinal knowledge to be an integral part of biodiversity (Gepts, 2004) and to treat indigenous knowledge as common heritage of mankind (Soejarto *et al.*, 2005). This tendency has also been encountered amongst those advocating for the property rights of indigenous peoples.

Until the 1970s, the concept of Common Heritage of Mankind was thus the principal policy towards biodiversity and indigenous medicinal knowledge protection.

On the surface, it seemed a good solution. However, this proposes that indigenous medicinal knowledge, considered as Common Heritage of Mankind, should not be the property of any individual or group (Trotti, 2001). Common Heritage of Mankind made it very difficult for indigenous people to acquire property rights over their indigenous medicinal knowledge (Godshall, 2003).

The current measures of intellectual property rights were conceived with the Western notion of property and knowledge in mind. This is so much so, that intellectual property rights often send the message that indigenous knowledge should be considered as part of the public domain. In the making of policies, there are three main conceptual views on the nature of knowledge categories (view one and two are most prevalent): (i) that there are two types of knowledge – that in the public domain, and that in the private domain, protected by intellectual property rights (Timmermans, 2003); (ii) that there is knowledge in the public domain, but also two types of private domain knowledge – that protected by intellectual property rights, and that protected by customary law (Dutfield, 2000); and (iii) that there exists three types of knowledge: (a) public domain knowledge, (b) community knowledge and (c) private domain knowledge. In the first two views, indigenous medicinal knowledge will easily fall into the public domain knowledge type, which prevents anyone, indigenous people included, from obtaining intellectual property rights over the knowledge. The third view, importantly, stresses that knowledge shared by a group does not make it public domain knowledge, but rather community knowledge (Gupta, Gabrielsen and Ferguson, 2005). Indigenous medicinal knowledge should most often fit within this community knowledge category.

The Clash between Current Intellectual Property Rights and Indigenous Medicinal Knowledge

Many fundamental differences between indigenous medicinal knowledge and Western intellectual property rights make it difficult for these two to work together. Here we will look more closely at these differences and their implications, and we will conclude with possible solutions for reconciliation in a cross-cultural perspective.

The terms indigenous knowledge, indigenous medicinal knowledge and even indigenous people are ambiguous. Various definitions for each of these terms exist, and there is not agreement about what exactly should constitute each of these three terms (Godshall, 2003). These definitional ambiguities alone make it difficult to meet the required legal standard to prove that indigenous knowledge is knowledge. We will take a look at the domino effect that this creates.

The first problem is to prove that indigenous medicinal knowledge should be considered as knowledge. Indigenous knowledge is often considered to be subjugated knowledge and as such, is disqualified as inferior knowledge (Swazo, 2005). However, even when indigenous medicinal knowledge is recognized as knowledge, other problems arise. As stated earlier, a basic 'rule of the game' is that intellectual property rights are granted to elements of which no prior use or knowledge exists. Because indigenous medicinal knowledge is often communally held knowledge, it is difficult to establish that the indigenous medicinal knowledge is not already in the public domain. Indeed, as stated earlier, the two following views about knowledge types are prevalent: (i) that there are two types of knowledge: that in the public domain, and that in the private domain, and (ii) that there is knowledge in the public domain, but also two types of private domain knowledge: that protected by intellectual property rights, and that protected by customary law.

Even when the indigenous medicinal knowledge is proven not to be, as of yet, part of the public domain, arguing that it should not automatically become part of the public domain becomes the next challenge. At this point, it is necessary to argue that the indigenous knowledge being communal, it should be under the authority of the communities concerned. It then becomes necessary to prove that there exist specific communal ownership concepts within the indigenous community which apply to the indigenous medicinal knowledge in question. Intellectual property rights defenders must show that there are authority figures within the indigenous communities, such as traditional healers and tribal elders, and that these authority figures have the right to determine the conditions under which access is to be granted to the indigenous medicinal knowledge under consideration.

Succeeding to demonstrate that indigenous communities have the authority to decide how and to whom their knowledge is to be disclosed depends on demonstrating that indigenous medicinal knowledge is different from Western knowledge; that it has its own criteria of belongingness, its own rules and purposes, and that indigenous medicinal knowledge 'has the right' to be protected by intellectual property rights which suit its nature, just as current intellectual property rights suit the nature of Western knowledge.

In summary, the obstacles to the legal recognition of indigenous medicinal knowledge are the following: (i) one must prove that indigenous medicinal knowledge is knowledge, (ii) one must prove that indigenous medicinal knowledge is not part, and should not become part, of the public domain, (iii) one must show that authority figures in indigenous communities are present and that they must be granted control over their indigenous

medicinal knowledge, (iv) one must demonstrate that granting communities control over their indigenous medicinal knowledge implies the creation of intellectual property rights that allow such proceedings, and that applying intellectual property rights to indigenous knowledge is no more of a concession than applying the current intellectual property rights to Western knowledge.

The fundamental problem here seems to be, then, a problem of paradigms. A continuous challenge throughout this process is to keep in mind that just as indigenous medicinal knowledge is a culturally-adapted construct, so is Western knowledge. And that just as indigenous medicinal knowledge defenders seek to formulate policies and laws that can fit the nature of indigenous medicinal knowledge, so have current intellectual property rights been modeled according to the nature of Western knowledge.

In seeking to provide equal chances of intellectual property rights both to Western and indigenous knowledge, it is of primordial importance to keep in mind that all products of a society are influenced by its culture, its 'worldview'.

Actions Taken to Date

Some significant actions to protect indigenous medicinal knowledge have been taken. The Convention on Biological Diversity, enacted in December 1993, recognized that biological and genetic resources should be the property of a given party, a statement that contradicts the Common Heritage of Mankind position that biological and genetic resources can be used by everyone. Moreover, the Convention on Biological Diversity acknowledges the contribution of the medicinal knowledge of indigenous healers to Western science, and calls for intellectual property rights to be put into practice for the indigenous people concerned. The Convention on Biological Diversity has been ratified by 179 countries and the European Union; in these countries, companies can no longer, in theory, harvest bio-resources without acknowledging indigenous ownership. It is worth noting that the United States has not participated in the convention (Gurib-Fakim, 2006).

The weakness of the Convention on Biological Diversity is that it only proposes a new view, but does not have the authority to impose international rules or standards. Intellectual property rights are the responsibility of each sovereign nation, and thus, nations agreeing to the Convention on Biological Diversity are free to determine how they wish to apply its principles. This is problematic, given that indigenous peoples are not the politically dominant groups in their countries (Swazo, 2005). More often than not, their governments are not sincerely concerned with the indigenous peoples; let alone their intellectual property rights, and thus the principles of the Convention on Biological Diversity are not likely to be enforced. Or, should they be, the national governments are likely to take ownership of the economic benefits gained, leaving the indigenous people as empty-handed as before.

The Trade-Related Aspects of the Intellectual Property Rights Agreement partly solves this problem of lack of international standards. Trade-Related Aspects of Intellectual Property Rights Agreement is the Annex 1C of the *Marrakesh Agreement Establishing the World Trade Organization*, adopted in 1994 (WTO, 1994). The Trade-Related Aspects of Intellectual Property Rights Agreement made intellectual property part of international trade law. This obliges all nations to follow international standards with respect to intellectual property, as determined by the World Trade Organization. It stipulates that patents must be available for all inventions, as long as they meet patent criteria within the country

concerned. However, not much in the Trade-Related Aspects of Intellectual Property Rights Agreement refers to indigenous intellectual property rights. Indeed, attempts to include indigenous intellectual property rights often meet objections (IITC, 2002). Again, when a patent is requested for indigenous healers' medicinal knowledge, this knowledge, which is most often communal, does not meet the patent criteria (Timmermans, 2003). This is because the patent criteria have not been modified to include the nature of indigenous knowledge.

Some advances have been made by indigenous groups and non-governmental organizations. Currently, some aspects of indigenous intellectual property rights are taken into consideration by the World Trade Organization and the World Intellectual Property Organization. Indigenous peoples' rights to intellectual property rights have been recognized, as has been the contribution of their indigenous medicinal knowledge to Western medicine. Nonetheless, further modifications of intellectual property law need to be made to include indigenous knowledge.

4.4.2 The Specific Cases of Quinine, Coca and Ayahuasca; Intellectual Property Rights Issues

Examples of problems that arise from the inadequacy of status quo intellectual property rights will be demonstrated in this section, by looking at the three plants described earlier as examples of medicinal plants used by indigenous peoples. The first case to be discussed is that of the *Cinchona* bark, whose alkaloid quinine is used to treat malaria. The second is the case of the psychotropic coca. It is here presented as an example of past intellectual appropriation of indigenous healers' medicinal knowledge which has gone unresolved. The last case is that of the psychotropic ayahuasca. Ayahuasca is presented as an example of a resolved case of intellectual property appropriation, albeit with problems.

Quinine – Legal Issues

Cinchona ledgeriana, the botanical name of the plant which contains quinine, speaks of its past. According to the historical account, the countess of Chinchona (Spain), very ill with fever during a trip to South America, was prescribed *Cinchona* (quinaquina in the Quichua language) by Incas, which cured her fever. The Englishman Charles Ledger is then said to have 'discovered' the most effective type of *Cinchona* for the treatment of malaria. Less well known is Manuel Inca Mamani, who had the knowledge and expertise to identify the variety of plants and trees which Ledger was hoping to find (Rocco, 2003). Mamani helped Ledger select the plants and trees richest in quinine, thirteen times richer than the ordinary *Cinchona ledgeriana* tree in Bolivia (Allen, 1989). Manuel Inca Mamani was a young Inca man from the region of Loxa (Loja), Ecuador.

Also, during World War II, the United States obtained large quantities of quinaquina bark (nearly 6 million kilograms) from Ecuador. In this instance too, Quichua plant experts assisted in the collection of the quinaquina bark (Rainey, 1946). Their help went unacknowledged.

No recognition or payment has ever been given to the indigenous people who helped Europeans treat malaria. In the case of quinine, the main problem for indigenous people in trying to obtain legal intellectual property rights is that undocumented knowledge held

abroad is not recognized by the US' patent laws. Moreover, even when it is recognized, it is extremely difficult for it to be considered as state of the art knowledge that should disqualify a patent claim related to that knowledge. In 1995, Lord Hoffman of the British House of Lords asserted that a single entity can have several definitions depending on the perspective of the person making the definition (Dutfield, 2001). For this reason, it should not be the case that only one definition for an entity is considered valid. To illustrate his assertion, Lord Hoffman used the case of quinine. He argued the following:

The Amazonian Indians have known for centuries that cinchona bark can be used to treat malarial and other fevers [...]. Does the Indian know about quinine? My Lords, under the description of a quality of the bark which makes it useful for treating fevers, he obviously does. I do not think it matters that he chooses to label it in animistic rather than chemical terms. [...] If shown pills of quinine sulphate, he would not associate them with the cinchona bark. [...] And he certainly would not know about the artificially synthesized alkaloid.

Although the indigenous people do not have the knowledge of quinine as a molecule or a chemical formula, they have another type of knowledge that is just as valid. When determining whether a proposed entity is patentable or not, it seems that prior art, although of another kind, should be considered as such and should have the capability to disqualify a patent candidate on grounds of lack of novelty (Dutfield, 2001).

Coca – Legal Issues

The use of coca as a local anesthetic was known by the indigenous people of the Andean region prior to the arrival of the Europeans. It is clear that the indigenous healers' knowledge of the medicinal properties of cocaine greatly contributed to the later use of cocaine in Western medicine (Eunice, 1947). Yet no remuneration or recognition has been given to the indigenous people concerned. Current law concerning intellectual property rights makes it difficult for remuneration or recognition to be given.

It is difficult to argue the case for coca, because the problem of identifying an individual or a group owner of the knowledge about this plant arises. In cases like this, adoption of a First Nations Intellectual Property Act could be a solution. This act could be adopted as an amendment to the North American Free Trade Agreement, or as separate legislation in each country. For many indigenous peoples' inventions and knowledge, it is not possible to designate ownership to one person, one group or even one nation. Jack Forbes, professor of Native American studies at the University of California, Davis, has proposed that the First Nation Intellectual Property Act stipulate that royalties must be paid for the use of indigenous peoples' inventions and products, and that these royalties be deposited in a First Nations International Bank. This bank, a non-profit corporation, would be controlled by an Indigenous Board of Trustees, which would determine the use of these funds (Forbes, 1997). Such a system could be used in South America and Central America as well.

Ayahuasca – Legal Issues

In 1986, US entrepreneur Loren Miller obtained a patent on a variety of *Banisteriopsis caapi*, also called Ayahuasca, used to make the Ayahuasca beverage. He named it Da Vine. In 1994, the Coordinating Body of Indigenous Organizations of the Amazon Basin

(COICA, Ecuador) learned of Miller's patent. They found it absurd, given that the plant has been known and used by indigenous people of the Amazon for centuries.

In 1999, the Center for International Environmental Law filed a request for reexamination on behalf of Coordinating Body of Indigenous Organizations of the Amazon Basin and the Amazon Coalition. The Center for International Environmental Law argued that: (i) Da Vine is neither new nor distinct, and thus violates the novelty requirement under the Patent Act; (ii) Da Vine is found in an uncultivated state and thus violates the Plant Patent Act, which prohibits patenting these plants; (iii) Da Vine is a sacred plant to indigenous people (i.e. it is used as part of religious rituals) and thus granting a patent on it constitutes an immoral action, a violation of the utility criterion under the Patent Act.

On May 28, 1999, the US Patent and Trade Office granted the reexamination request. However, it did not grant the reexamination because of the Center for International Environmental Law's argument that Amazonian people's knowledge of the plant nullified Miller's patent. The Patent and Trade Office granted reexamination because in its request, the Center for International Environmental Law mentioned that Da Vine was similar in physical appearance to another *B. caapi* plant found in a US herbarium collection. It was this *B. caapi* specimen found in the herbarium collection of the Field Museum of Chicago which nullified Miller's patent.

It must be pointed out that the Patent and Trade Office's grounds for re-examination of the Miller Patent avoided the question of whether the knowledge of the use of a plant by generations of indigenous peoples should constitute prior art under the patent rules. It also failed to address the question of whether patenting a plant sacred to indigenous people should be considered immoral, and thus a violation of the utility criterion.

The US Patent and Trade Office thus revoked Miller's patent on very narrow grounds – Miller's patent violated the novelty criterion under the Patent Act, because *Banisteriopsis caapi* specimen were described on herbarium sheets in the Field Museum of Chicago (35 USC § 102 (b)) over one year prior to the patent request. Although COICA was successful in obtaining a patent revocation, this case did not initiate a debate on the need for changes in the current intellectual property rights laws. Furthermore, the Patent and Trade Office stated that the Center for International Environmental Law's grounds for patent revocation were invalid. The Center for International Environmental Law's argument of novelty violation due to prior indigenous knowledge of Da Vine was not valid, because it did not fall into any of the four categories of prior art under US Patent law (see Table 4.1).

Table 4.1 The three criteria a discovery/invention (X) must meet to be granted a patent in the United States.

Criteria	Implications
Novelty	<ul style="list-style-type: none"> ● No prior knowledge of X in the United States ● No prior use of X in the United States ● No prior patent of X in any country ● No printed publications of X in any country
Non-obviousness	<ul style="list-style-type: none"> ● That X is not obvious to someone with ordinary skill in the particular art.
Utility	<ul style="list-style-type: none"> ● That the discovery or invention has at least some kind of trivial use ● That it causes no harm; that is, that it has no illegal or immoral purpose.

It seems reasonable to argue that the Patent and Trade Office's failure to review the pertinence of the Patent Act criteria in this indigenous knowledge case demonstrates a clear cultural bias. The three criteria were not questioned; they were considered to be objective and neutral requirements to grant patents. This constitutes in itself a cultural bias, for the criteria of the Patent Act are inevitably culturally determined criteria; criteria produced within the Western paradigm.

CONCLUSION

Intellectual property protection has increased in many areas in recent decades. Yet, as regards indigenous intellectual property protection, not much progress has been achieved. Too often, indigenous intellectual property is considered similar or equal to public domain. What is needed is general acceptance that all laws and norms are culturally-constructed, and thus, that laws be enacted to protect indigenous knowledge as property, in the same way that laws protect intellectual property for other nations.

In 1993, the Julayinbul Statement on Indigenous Intellectual Property Rights adopted in Australia concerning indigenous peoples' intellectual property rights stated the following:

... Indigenous Peoples and Nations also declare that we are capable of managing our intellectual property ourselves, but are willing to share it with all humanity provided that our fundamental rights to define and control this property are recognized by the international community (Hunter and Jones, 2004).

Ensuring that intellectual property rights are applied to indigenous medicinal knowledge would allow indigenous populations to derive, from the use that others make of their indigenous medicinal knowledge, financial benefits which are sorely needed in many indigenous communities that have experienced centuries of colonization and exploitation.

If indigenous people were fairly recognized and compensated for the contributions their indigenous medicinal knowledge have made to Western medicine, they would be more likely to participate in Western scientists' search for new medicinal products. In the long-run, indigenous people holding medicinal knowledge could work in partnership with Western scientists to create new drugs that could benefit people everywhere. Moreover, should indigenous people be granted rightful compensation for their contribution to Western medicine, poverty levels could be reduced in indigenous communities.

NOTES

1. Interestingly, tamoxifen is also currently under scrutiny as a drug to treat manic symptoms in bipolar disorder patients – it is, up to now, the only selective protein kinase C inhibitor known to be able to cross the blood-brain barrier. Zarate, C.A. Jr., *et al.* (2007).
2. Trepanation was a type of skull surgery performed by Incans. Specific holes were made in the skull, as part of treatment for headaches, cranial fractures and mental illness. Coca was used by the Incan healers to anesthetize the cranial wound and alleviate the patient from pain during the trepanation procedure. Sgan, S.L. (1998).
3. Mestizos, in Latin America, are the dominant group. They are of both Spanish and Indigenous descent, but they shun their indigenous roots and seek to identify themselves as being solely of European descent.

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