

2007

Bioprospecting and Biopiracy in Latin America: The Case of *Maca* in Perú

Amanda J. Landon

Follow this and additional works at: <http://digitalcommons.unl.edu/nebanthro>



Part of the [Anthropology Commons](#)

Landon, Amanda J., "Bioprospecting and Biopiracy in Latin America: The Case of *Maca* in Perú" (2007). *Nebraska Anthropologist*. 32.
<http://digitalcommons.unl.edu/nebanthro/32>

This Article is brought to you for free and open access by the Anthropology, Department of at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Anthropologist by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Bioprospecting and Biopiracy in Latin America: The Case of *Maca* in Perú

Amanda J. Landon

*Abstract: Bioprospecting is a popular venture in Latin America due to the regions' high concentration of the world's biodiversity. This activity has an impact on the native peoples living in areas with potentially profitable plants. They can lose access to traditional plants and extraction processes when companies patent indigenous cultivars and knowledge. In many cases, they cannot patent their cultivars and knowledge before others due to cultural and monetary restrictions. In this paper, I examine the legal and cultural context surrounding the battle over *Lepidium meyenii* (maca) in Perú. PureWorld, Inc., a United States pharmaceutical company, patented the extracts derived from the plant. It sells these extracts to treat sexual dysfunction in humans and other animals. The pharmaceutical company also patented the extraction technique. Indigenous peoples in Perú had already known about the extracts, the uses for the plant, and the extraction technique for thousands of years. They are suing to overturn the patents on maca, not to claim patents on the plant for themselves but to return the plant to their cultural domain. They have found a way to solve their problem with biopiracy without sacrificing their cultural values.*

Introduction

Latin America is a popular destination for bioprospecting, and has produced numerous lucrative plants, including the enola bean and the *maca* plant. Companies that bioprospect do not, however, always respect the interests and values of the indigenous peoples from whom they gather ethnobotanical information and resources. This article discusses biopiracy and bioprospecting in Latin America as they relate to law, patents, and indigenous groups, focusing on the legal battle over *Lepidium meyenii* (*maca*) in Perú. The indigenous peoples in Perú are using strict Peruvian patent laws to return an important plant to indigenous control without sacrificing their cultural values.

An understanding of intellectual property rights and patents as they apply to indigenous cultures is important for understanding the issues surrounding biopiracy. In the United States, two types of patents can apply to plant materials: a utility patent for nonobvious, useful, and unique plant materials that requires users to pay royalties, and plant variety protection that requires additional uniformity, but requires no royalties (Brush 1993). Brush (1993) argues that applying intellectual property rights to indigenous knowledge is difficult due to the nature of indigenous knowledge and communities. To innovate, indigenous communities use communal effort, referred to as collective invention, in which members of a society freely share information that is used by other members. In this sense, indigenous knowledge is communal or public knowledge. In addition, due to trading knowledge between groups, it is difficult to define the group or groups that own the knowledge. If one indigenous group patents part of its communal knowledge and resources, other indigenous groups that also rely on the knowledge and resources are left out (Brush 1999). Even if indigenous groups could find an equitable way to draw a line between who does and who does not own certain parts of indigenous knowledge, patents are not always compatible with the community-centered values of indigenous groups. If indigenous groups do not patent their plant resources, allowing corporations such as pharmaceutical companies to patent part or all of an indigenous cultivar legitimizes an act that is otherwise culturally reprehensible (Brush 1999). Indigenous groups in Perú object to the patents that PureWorld, Inc. has on *maca* for both economic and cultural reasons (see case study).

Bioprospecting refers to acquiring biological resources that represent the property of another group of people without a contract that assures compensation for access to that genetic resource. This notion assumes that the resource is property in the sense that an individual or group of individuals literally owns the resource. Some of these resources originated in open exchange systems in which many individuals from multiple groups contributed to the cultivar and associated knowledge, so no easily distinguished group claims ownership (Brush 1999). Bioprospecting, in contrast, requires reciprocity. The researcher provides both short-term and long-term payments for access to the genetic resources (Brush 1999).

The Global Exchange, a group that follows the issues facing indigenous peoples in Mexico, also brings up the problems associated with what they refer to as the “privatization of life” (2001:3). The privatization of biological materials is a concern because it can result in a monopoly over certain natural resources, prevent indigenous peoples from being able to obtain food, water and health care, as well as require

indigenous peoples to pay for traditional medicines and foods that used to belong to them. In this sense, biopiracy also includes corporate restriction on the traditional lives of indigenous peoples by way of limiting their access to the natural resources that they have traditionally used for various purposes. The effects are twofold: indigenous peoples can be denied compensation for their knowledge and be charged to use the resources the companies discovered using indigenous knowledge.

Biodiversity, Indigenous Peoples, and Trade

The Earth's biodiversity "hot spots" tend to be concentrated in the tropics (Kleidon & Mooney 2000). Areas with high biodiversity also tend to be in countries with the highest poverty levels, especially with regard to those living in rural areas. This correlation holds true in Latin America where tropical rainforests entice many pharmaceutical companies hoping to make a profit from plant extracts, as well as a region with a large poor rural population (Bierer et. al 2006). The companies wishing to gain access to economically useful plants and animals must, then, look to biodiverse countries and the people who have experience with the plants to maximize their success in bioprospecting ventures. The North American Free Trade Agreement (NAFTA), the Rio Convention on Biological Diversity, and the Marrakech Agreement are international agreements that affect bioprospecting and trade in Latin America.

NAFTA removed trade barriers between Mexico, the United States, and Canada (United States Trade Representative 1993). In summary, the agreement reduces or eliminates tariffs on NAFTA goods, defines goods covered by NAFTA and sets up guidelines for how much of said products must be made out of materials from NAFTA countries. The majority of the document consists of lists of these items and under which category each falls, as well as definitions of items. Annex VII deals with these definitions in relation to Mexico. Pharmaceutical products, including some raw materials from which the pharmaceuticals are extracted, are covered in the agreement. This means that medicinal plants that were found in Mexico and are being used by pharmaceutical companies in the United States and Canada are covered under NAFTA and are not subject to protectionist tariffs (United States Trade Representative 1993).

NAFTA operates at the governmental level, not between the individuals making the transaction. While the United States, Canada and Mexico receive some compensation for the resources that are taken out of their countries, the individuals who originally discovered the resources may be left out. As a result of the agreement, pharmaceutical

companies use indigenous knowledge to find plant products to patent and are not legally required to compensate them.

Numerous countries, including the United States and Perú, signed the second two agreements. The Rio Convention on Biological Diversity of 1992, signed by 162 countries, gives states the right to sovereign control over their genetic resources. Each state determines who has access to the genetic resources and what sort of compensation those granted access must provide in return (Kadidal 1993). The Marrakech Agreement, signed by members of the World Trade Organization, includes a section that deals with intellectual property rights called the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The agreement allows countries to declare that certain objects cannot be patented in order to prevent commercial exploitation. These objects include plant and animal life (World Trade Organization 1994). These agreements are also between governments, not individuals or groups within the countries. Perú passed laws regarding patents and biological diversity that protect Peruvian plants from patents. These laws are helping indigenous peoples in the country protect indigenous plant cultivars.

Biopiracy, Law, and the Patent System

Businesses, which usually operate on a utilitarian and legal ethical system (meaning ethics are based on that which is legal and is considered most useful to themselves and possibly others) see putting patents on parts of life forms and derivatives of indigenous knowledge as justifiable. Since patents are temporary, the business will not hold a monopoly over the plant product forever. Businesses may use indigenous knowledge to narrow down which plants to use, but they see their role as adding to incomplete, communal knowledge, which is seen as public rather than private (Chen 2004). Businesses will patent extraction techniques, the chemical reasoning behind the utility of a plant and sometimes parts of the plant itself that were uncovered in a laboratory. They see processing the plant in the lab as creating something new and patentable (Gollin 1999).

Patents are expensive, although precise cost depends on how many claims are made in the patent application, which fees apply to the patent, whether the patent is to be national or international, and other conditions. The price ranges from hundreds to thousands of dollars (United States Patent and Trademark Office 2006). This financial barrier alone prevents most indigenous peoples in Latin America from patenting their own knowledge, extraction techniques, and cultivars to protect against utilization by other groups (Global Exchange 2001).

Indigenous cultural values can also prevent these groups from obtaining patents. Patents are immoral in some indigenous value systems due to the groups' focus on communal rather than private ownership (Global Exchange 2001). In this situation, it would be difficult for a company to compensate the peoples from which it gained information about plants since this exchange could be seen as an attempt to buy their knowledge of the plants. This is a problem that comes from differences in cultural values, especially those regarding ownership. Illegal biopiracy usually deals with what occurs between companies and states, leaving out laws to protect the knowledge of indigenous peoples. Since indigenous knowledge is communal, it is usually viewed as public domain by law. This situation can create problems for the indigenous peoples when companies interview them for information about plants. There is no way for them to protect their knowledge, barring legal action if the company is backed by an entity with more power, such as the Peruvian government in the case of the *maca* patents (see case study).

Indigenous peoples are not only left open to offense from the patent system. They can also lose their ability to sell their own plants, as was the case with the enola bean in Mexico. POD-NERS, a United States seed company, patented the bean and later sued Mexican companies that were selling the bean in the United States (Global Exchange 2001). The patent system can also lead to indigenous cultivars being patented by companies that neither cultivated nor greatly altered the plant (Gept 2004). Indigenous peoples have been prevented from replanting and selling their own seeds as a result of the patent system.

Legally, there are grave consequences for companies that break the law in regard to biopiracy. According to attorney Michael A. Gollin (1999), companies that violate biopiracy laws can: have their patents revoked, lose the profits that they gained from the illegal patent, be prohibited from collecting future samples, and face jail time. Legally defined, biopiracy refers to failing to obtain permission to collect samples, failing to disclose one's motivations in collecting samples, failing to follow national laws, or failing to follow the company's self-regulatory guidelines. Left out are widespread laws protecting indigenous peoples' intellectual and material property rights.

Patent laws do not cover indigenous communal knowledge since it is seen as old, public domain knowledge. Private knowledge is covered, but such knowledge must be new and based on a discovery or innovation. Since indigenous peoples do not have the finances to patent the plants themselves, companies are generally free to do so when they find something commercially useful. They can also patent

extraction techniques and applications of the plant or parts of the plant since they have the money to do so. It is the immoral rather than the illegal biopiracy with which organizations such as Global Exchange, a group that tracks instances and effects of biopiracy in Mexico, are concerned.

Some companies and countries are, however, taking steps to make bioprospecting a more equitable venture. Shaman Pharmaceuticals acknowledges the contribution of indigenous knowledge to the company's bioprospecting success. The pharmaceutical company claims that 75% of their pharmaceutical products were found thanks to the help of indigenous peoples (Bierer et al. 2006). Shaman Pharmaceuticals believes that it has found a way to fairly compensate the indigenous peoples with whom they work. The company argues that, since years can pass before one even knows whether or not a new drug will make a profit, both immediate and long term forms of compensation are necessary. In the short term, they have assisted communities with their health needs by setting up clinics. In the long term, they plan to give part of their profits to the communities and countries from which they have acquired plants (Bierer et al. 2006).

Some countries, such as Costa Rica, have found a way to arrange for some of the money from bioprospecting ventures go to the indigenous peoples who live in the areas where the searches have occurred. According to Costa Rica's Biodiversity Law, indigenous knowledge is included in the definition of Costa Rican biodiversity (La Asamblea Legislativa de la República de Costa Rica 1998). Prior informed consent must be given before the initiation of any bioprospecting venture to all involved, including the indigenous peoples of the area. Companies wishing to go bioprospecting must purchase a permit in addition to allocating 10% of their research budget and as much as 50% of bonuses to the Costa Rican government for the National System of Conservation Areas or the indigenous peoples and/or private owners on whose property the specimens were found. The companies may be required to pay additional money to the government in the future to compensate for anything they gain by using Costa Rica's biodiversity (La Asamblea Legislativa de la República de Costa Rica 1998).

Merck, INBio, and the Costa Rican government reached a deal that fulfills this law. Merck pays INBio money to collect samples in Costa Rica. Merck then pays royalties to INBio for money it makes from developing the samples into drugs. Fifty percent of the royalties gained by INBio go to the Costa Rican government for projects related to biodiversity and conservation (Coughlin 1993).

Maca in Perú, a Case Study

Indigenous peoples are not without options. *La Iniciativa para la Prevención de la Biopiratería en Perú*, a Peruvian legal group, is aiding the indigenous peoples there, mostly Quechua and Aymará speaking peoples, to revoke the patents held on one of their traditional medicinal and food plants, *maca* (*Lepidium meyenii*) (*Comisión Nacional contra la Biopiratería* 2005). The following case study explores the Peruvian legal setting and *maca* patents, as well as the reactions of the Peruvian government and indigenous peoples. The indigenous peoples of Peru are using Peruvian law to their advantage in order to overturn the patents and to avoid having to define who owns *maca*.

Perú's General Environmental Law (No. 28611) establishes the rules and regulations related to the biodiversity of the country, as well as the responsibilities of citizens in relation to the law. One part of this law specifically provides for the rights of indigenous peoples and traditional communities with regard to their cultures, knowledge, and ways of life (Legislative Branch of the Republic of Perú 2005).

There are currently four main patents held on parts of the *maca* plant by PureWorld, Inc. In one US patent, PureWorld, Inc. claims the right to the cellulose-free version of the same extract used by indigenous peoples in the Andes. They also claim the extraction technique. Indigenous use of the plant is mentioned briefly in the description section of the patent (Zheng et al. 2001). In another US patent, the company claims more *maca* extracts, the way in which these extracts are used to treat sexual dysfunction in animals (including humans), and how the drug is administered to animals (Zheng et al. 2002). The company claims several more extracts and the methods with which to obtain the extracts in a third patent (Zheng et al. 2003). In the final patent, the company patents claims rights to several more extracts used as treatments for different forms of cancer. This particular patent includes a comparatively extensive section of background information about common indigenous uses of the *maca* plant, including use as a highly nutritional food source and effective medicine (Cui et al. 2005).

The government of Perú recognizes that patents are important tools for businesses in their quest for discoveries, innovations, and profits. The Delegation of Perú (2003) at the Geneva Convention expressed its views that biopiracy should be dealt with in political rather than legal terms since the law generally addresses companies, the government, and individuals rather than communities such as the indigenous communities. According to Peruvian law, patents cannot be

held on parts of plants, including extracts, since neither invention nor creative action is involved. Patents including extracts of biological origin, such as maca extracts, or including indigenous knowledge, are not recognized in Perú (Legislative Branch of the Republic of Perú).

In the same paper, the Delegation of Perú (2003) acknowledges that *maca* is a plant that has been cultivated over thousands of years by the indigenous people of Perú. They cite historical references as far back as the 1500s to show that the plant was known outside of the indigenous community, as well, for a long time. They also cite examples that show that the indigenous peoples and traditional communities that have been using *maca* for generations and have known about at least some of the components of the root that the company has patented. The rest of the components were previously described in a bachelor's thesis by a student at a Perú university (Roldán 1961, Delegation of Perú 2003). In the patents, the company acknowledges that indigenous peoples had prior knowledge of the plant's medicinal use in helping animals with sexual dysfunction. In the government of Perú's view, PureWorld, Inc. has discovered nothing and should not hold patents over *maca*.

The indigenous peoples of Perú now face a problem relating to the demand for *maca* worldwide, which requires so much of the plant to be exported. In addition, PureWorld, Inc. has patented an extraction technique that is very close to that employed by the indigenous peoples using the plant; the only difference is the final step in which the company removes the cellulose from the extract (ETC Group 2002). Indigenous peoples are also aware that they knew of the many uses of *maca* before PureWorld, Inc. patented anything related to *maca*. PureWorld, Inc. has not discovered anything that their traditional communities did not already know. They hope to revoke the PureWorld, Inc. patents rather than demand royalties from the company's profits (Trade Environment Database 2006).

Conclusion

With the backing of the Peruvian government, the indigenous peoples living in the Andes are fighting to revoke PureWorld, Inc.'s patent rights, at least in Perú if not in the United States. The indigenous groups are not going to claim patent ownership on the *maca*. They avoid designating which groups have the right to the plant by keeping it in the realm of communal knowledge and cultural property. They are not sacrificing their values by claiming individual ownership of the plant, either. The indigenous peoples have found a solution that is suitable for them in their cultural context. The laws of

the two countries involved differ in relation to patents, but without Perú's recognition of the US patents held by PureWorld, Inc., the indigenous and traditional farmers will be allowed to continue using their traditional medicine and selling their extracts outside of the United States.

This case study shows that, in spite of the interests of businesses that bioprospect conflicting with indigenous interests, indigenous peoples can protect communal knowledge and cultivars on indigenous terms. They do not have to bow to national or international pressure to either patent their knowledge and cultivars or accept royalties from others who patent them. TRIPS and the Convention on Biological Diversity give countries the right to sovereign control over their plant resources and patents, allowing countries to pass legislation that protects indigenous resources. It is vital that indigenous peoples have legal recognition, as they do in Perú, to protect their culture from exploitation.

Acknowledgements

I would like to thank Dr. Carleen Sanchez for the time and effort she put in to suggesting changes to improve this paper. I would also like to thank the editors of this volume. Finally, I would like to thank friends in the Lincoln area for encouraging me through the process of preparing this paper for publication.

References Cited

- Bierer, D. E., T. J. Carlson, and S. R. King
2006 Shaman Pharmaceuticals: Integrating Indigenous Knowledge, Tropical Medicinal Plants, Medicine, Modern Science and Reciprocity into a Novel Drug Discovery Approach. San Francisco, CA: Shaman Pharmaceuticals, Inc. Electronic document, <http://www.netsci.org/Science/Special/feature11.htm>, accessed December 8, 2006.
- Brush, S. B.
1999 Bioprospecting the Public Domain. *Cultural Anthropology* 14(4):535-555.
1993 Indigenous Knowledge of Biological Resources and Intellectual Property Rights. *American Anthropologist* 95(3):653-671.

- Chen, J.
 2004 There's No Such Thing as Biopiracy, And It's A Good Thing, Too. *McGeorge Law Review* 37:1-35.
 Comisión Nacional contra la Biopiratería.
 2005 Análisis de Potenciales Casos de Biopiratería en Perú. *Iniciativa para la prevención de la biopiratería: Documentos de investigación* 1(3):1-20.
- Coughlin Jr., M. D.
 1993 Using the Merck-INBio Agreement to Clarify the Convention on Biodiversity. *Columbia Journal of Transnational Law* 31(2):337-375.
- Cui, B. L., B. L. Zheng, K. He, and Q. Y. Zheng
 2005 US Patent 6,878,731: Imidazole alkaloids from *Lepidium meyenii* and methods of usage. Washington, DC: United States Patent and Trademark Office.
- Delegation of Perú
 2003 Patentes referidas al *Lepidium meyenii* (maca): Respuestas del Perú. Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, Fifth Session, Geneva: 7-15 July 2003.
- ETC Group
 2002 Peruvian Farmers and Indigenous People Denounce Maca Patents. *Genotype*(3 July 2006):1-6.
- Gepts, P.
 2004 Who Owns Biodiversity, and How Should the Owners be Compensated? *Plant Physiology* 134:1295-1307.
- Global Exchange
 2001 Biopiracy: A New Threat to Indigenous Rights and Culture in Mexico. Electronic document, <http://globalexchange.org>, accessed November 1, 2006.
- Gollin, M. A.
 1998 Biopiracy: The Legal Perspective. *Nature Biotechnology* 17:921-922
- Kadidal, S.
 1993 Plants, Poverty, and Pharmaceutical Patents. *The Yale Law Journal* 103(1):223-258
- Kleidon, A., and H. A. Mooney
 1999 A global distribution of biodiversity inferred from climatic constraints: results from a process-based modeling study. *Global Change Biology* 6:507-523.
- La Asamblea Legislativa de la República de Costa Rica
 1998 7788 Ley de Biodiversidad. Electronic document, <http://www.elaw.org/assets/pdf/cr.leybiodiversidad.1998.sp>.

- pdf, accessed November 27, 2006.
- Legislative Branch of the Republic of Peru
- 2005 Law No. 28611: General Environmental Law. Lima, Peru.
- Roldán, G. C.
- 1961 Estudio fitoquímico de *Lepidium meyenii* Walp. Unpublished Bachelors degree thesis, Higher University of San Marcos, Lima, Perú.
- Trade Environment Database
- 2006 Maca: Traditional Knowledge, New World. Washington, DC: American University. Electronic document, <http://www.american.edu/TED/maca.htm>, accessed December 8, 2006.
- United States Patent and Trademark Office FY
- 2006 2007 Fee Schedule. Electronic document, <http://www.uspto.gov/web/offices/ac/qs/ope/fee2006october14.htm#patapp>, accessed December 9, 2006.
- United States Trade Representative
- 1993 North American Free Trade Agreement, Treaties and Other International Agreements. Electronic document, <http://www.gutenberg.org/etext/89>, accessed December 1, 2006.
- World Trade Organization
- 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights. Geneva, Switzerland: World Trade Organization.
- Zheng, B. L., C. H. Kim, S. Wolthoff, K. He, L. Rogers, Y. Shao, and Q. Y. Zheng
- 2002 US Patent 6,428,824: Treatment of sexual dysfunction with an extract of *Lepidium meyenii* roots. Washington, DC: United States Patent and Trademark Office.
- 2001 US Patent 6,267,995: Extract of *Lepidium meyenii* roots for pharmaceutical applications. Washington, DC: United States Patent and Trademark Office.
- Zheng, B. L., K. He, Y. Shao, and Q. Y. Zheng
- 2003 US Patent 6,552,206: Compositions and methods for their preparation from *Lepidium*. Washington, DC: United States Patent and Trademark Office.