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## Peruvian Farmers and Indigenous People Denounce Maca Patents

### *Extract of Andean Root Crop Patented for "Natural Viagra" Properties*

Indigenous peoples' and farmers' organizations from the Andes and the Amazon gathered at the offices of the Ecological Forum in Lima, Peru on 28 June 2002 to formally denounce US patents on maca, the high-altitude Andean plant (of the Cruciferae [mustard] family) that has been grown for centuries by indigenous peoples in the Puna highlands of Peru, both as a staple food crop and for medicinal purposes. Today, maca-based products are commonly promoted as natural enhancers of sexual function and fertility, and demand for maca is growing in the U.S., Europe and Japan. While maca exports have the potential to create new markets and income for Peruvian farmers, recent U.S. patents related to maca may actually foreclose opportunity for the true innovators of the Andean crop.

"The Andean region is becoming known as the 'biopiracy capital' of the world. We are deeply offended by monopoly patents on our food crops and medicinal plants," said Efraín Zúñiga Molina of the Association of Maca Producers of Valle del Mantaro. "We've seen patents on ayahuasca, quinoa, yacon, the nuña popping bean, and now maca," said Molina.

"These patents claim novel inventions, but everyone knows they are based on the traditional knowledge and resources of indigenous peoples," said Gladis Vila Pihue, a representative of the maca growers association, Department of Huancavelica (Peru).

The farmers are calling on two U.S. companies to abandon their patents related to maca, and they are asking the Peruvian government and the World Intellectual Property Organization (WIPO) to investigate and condemn monopoly claims related to maca that appropriate indigenous knowledge of farming communities. (The Geneva-based WIPO promotes intellectual property as a means of protecting indigenous knowledge.)

### ***Maca Patents***

**US Patent No. 6,267,995** – Pure World Botanicals, Inc. – Issued: July 31, 2001 – title: Extract of *Lepidium meyenii* roots for pharmaceutical applications. Applications pending in Australia, the European Patent Office, and at the World Intellectual Property Organization (WIPO).

**US Patent No. 6,093,421** – Biotics Research Corporation – Issued: July 25, 2000 – Title: Maca and antler for augmenting testosterone levels.

**US Patent Application No. 878,141** - Pure World Botanicals, Inc. – Published: April 11, 2002  
Title: Compositions and methods for their preparation from *Lepidium*.

The coalition is also requesting that the Lima-based International Potato Center (CIP), as promoter and protector of maca seed, take action to prohibit intellectual property claims – not just on seeds and genetic material held in its gene bank, but also on traditional knowledge of indigenous communities. The groups are asking CIP to declare a moratorium on the patenting of all Andean crop germplasm and their genetic components, and indigenous knowledge related to these genetic materials.

CIP is one of 16 international research centers under the umbrella of the Consultative Group on International Agricultural Research (CGIAR), the public plant breeding network responsible for safeguarding crop genetic diversity.

“We want to send a strong message that patenting indigenous knowledge is morally wrong and unacceptable,” said Pedro Rivera Cea, Director of the CHIRAPAQ-RAAA (Red Alternativa de agricultura Agroecológica), an indigenous peoples’ network based in Ayacucho (Peru).

### ***Maca Boom or Bust?***

Maca (*Lepidium meyenii* or *Lepidium peruvianum* Chacón<sup>1</sup>) grows at higher altitudes and has a higher frost tolerance than any other cultivated crop in the world. The tuberous roots of the maca plant can be eaten fresh or dried and stored for later consumption. Maca is a highly nutritious food source that survives at altitudes (up to 4,300 meters) where even potatoes cannot grow. Maca is also valued for its putative properties as a “natural Viagra,” fertility booster for animals and humans, and stamina-builder.

Twenty years ago agricultural experts declared that maca was in danger of extinction as a domesticated plant.<sup>2</sup> In 1989 the National Research Council of the U.S. labeled maca as one of the “lost crops of the Incas.”<sup>3</sup> But recent years have seen a “maca boom” due to pharmaceutical interest in the plant and growing demand for maca in Japan, the U.S. and Europe. In Peru, dried maca roots are ground to a powder and commonly sold in drugstores as a medicine and food supplement to increase stamina and fertility; maca is also mixed with hard liquor to make a popular “coctel de maca.”<sup>4</sup> While increased demand for maca has created new markets and income for Peruvian farmers, U.S. patents may ultimately foreclose opportunity for farmers and indigenous people who are the true innovators of the Andean crop.

### ***Peru’s “Lost Crop” Target of Predatory Patents***

“Maca may be a forgotten crop in the minds of foreign agronomists, but it has never been lost to indigenous peoples of the Andes,” said Alejandro Argumedo of the Quechua-Ayamara Association for Sustainable Livelihoods (ANDES) based in Cuzco, Peru. “Andean indigenous communities have been using maca for food and medicinal purposes since before the Conquest,” explains Argumedo. “Ironically, now we are in danger of losing maca – not to extinction – but to predatory US patents. When it comes to maca, it’s obvious that indigenous farmers are the true innovators, not chemists in New Jersey,” explains Argumedo.

“Ironically, now we are in danger of losing maca – not to extinction – but to predatory US patents.” – Alejandro Argumedo, Indigenous Peoples Biodiversity Network, Peru

Argumedo is referring to a US patent held by PureWorld Botanicals, Inc., a New Jersey-based company that specializes in botanical extracts. PureWorld’s patent on maca extract is not recognized in Peru, and thus does not currently prevent Peruvian people from growing, using or selling maca extracts. However, if PureWorld chooses to enforce its patent, the company could prevent maca extracts of Peruvian origin from being imported to the United States or anywhere else the patent is recognized. PureWorld is already seeking patent rights in Australia,

the European Patent Office, and at the World Intellectual Property Organization.<sup>5</sup> In addition, the company has a second US patent application pending on maca extract (published April 11, 2002). Another US-based company, Biotics Research Corporation, holds a patent on maca and antler for augmenting testosterone levels.

PureWorld Botanicals, Inc. operates the largest botanical extraction facility in North America. The company extracts over 15,000 pounds of crude botanical materials every day.<sup>6</sup> Maca is only one of over 1,000 plant extracts produced by PureWorld, but the company is probably the largest importer of maca in the United States.<sup>7</sup> The company holds US Patent No. 6,267,995 issued on July 31, 2001, entitled "Extract of *Lepidium meyenii* roots for pharmaceutical applications." The patent does not specifically cover maca seed or genetic material, but claims the isolated composition and the process used to make the maca extract.

PureWorld readily admits that maca "has been used by Peruvians for centuries as an energy and sex-enhancing botanical."<sup>8</sup> Its trademarked and patented product, MacaPure, is touted as a "scientifically proven libido and sexual function enhancer."

"We search every corner of the globe to find botanicals – and only the best make it into PureWorld extracts." -- *PureWorld Botanicals, Inc.*<sup>9</sup>

### ***Pure Patents? Is it New? Useful? Non-obvious?***

According to Professor Carlos Quirós, at the University of California, Davis, the Pure World patent describes making an alcoholic extract of maca roots. The process and formula are standard procedures, and the end product is not so different from the traditional method of extraction in Peru:

"This is pretty much the standard procedure to determine glucosinolates [by-products of maca that could translate into desirable medical and nutritional attributes] and isothiocyanates in crucifers and certainly applicable to any other species containing these compounds (see Kraling et al 1990, Plant Breeding 105:33-39). About its 'medical' use, this type of concoction has been used in Junin [Peru] for centuries and you can still see it today. If you go there, you will find in the streets juice stands where they blend the roots in water, or fruit juice for palatability and then add their 'aguardiente', which is a strong alcoholic liquor, plus other goodies. Although this mix will have cellulose, since they do not remove the root residues, I do not think that makes any difference."<sup>10</sup> –Prof. Carlos Quirós, University of California, Davis

A patent granted to Texas-based Biotics Research Corporation on July 25, 2000 claims to increase testosterone levels in men who orally ingest its mixture of powdered maca and elk antler.

### ***Peru's "Natural Viagra"***

Maca seeds represent centuries of cumulative selections by indigenous farmers, but it is only recently that scientists and governments have been growing out, testing and saving maca seeds. Because of the increasing demand for maca, both domestically and for export, the area planted to maca has expanded dramatically. In 1994, less than 50 hectares of maca were cultivated in Peru. By 1999, Peru saw a 24-fold increase to 1,200 hectares. Today, an estimated 2,000 hectares of maca are being cultivated.

Working closely with the International Potato Center (CIP), Química Suiza, the Peruvian distributor for pharmaceutical giant AstraZeneca, has invested more than \$1 million in maca research and development since 1994.<sup>11</sup> In 1999, Química Suiza exported about \$150,000 worth

of maca tablets to Japan, promoting it as a “natural Viagra.” Company officials claim that maca not only improves male and female fertility, but also increases energy and relieves stress.<sup>12</sup>

Previously, cultivation of maca was limited to two departments in Peru – Junin and Cerro de Pasco. Production now spans six Peruvian departments as well as parts of Bolivia and northwestern Argentina. Unfortunately, the increased demand for maca has resulted in overproduction, and depressed prices.<sup>13</sup> As a result, small farmers are not necessarily benefiting from the maca boom. In addition, some European countries have recently restricted maca imports because some products have not passed through regulatory channels.

Nobody knows for sure what varieties of maca are being grown for export. According to Michael Hermann of the International Potato Center in Peru: “Maca seed has traditionally been moved around, exchanged, etc. In any field you see a large part of the overall diversity (mainly root colors). Traders and exporters normally buy maca from trusted sources (or from anywhere) but my understanding is they do not seek particular maca variants.”<sup>14</sup>

Carlos Quirós of the University of California, Davis agrees: “I do not think there are as yet named varieties of maca, although there are researchers in Peru trying to develop uniform lines. I guess the producer[s] buy seed from growers or small seed retailers in Junin and plant whatever they find. I am pretty certain the material from Bolivia comes from the same source, so most likely the materials grown in Bolivia and Peru are the same.”

### ***Broken Trust?***

The International Potato Center (CIP) in Lima is the world’s most important repository for root and tuber germplasm. CIP’s gene bank holds 31 accessions of Peruvian maca, all collected from farmers’ fields, and all 31 accessions are designated “in trust” for the benefit of the international community.<sup>15</sup>

Under the terms of the 1994 agreement between the Consultative Group on International Agricultural Research (CGIAR) and the UN Food and Agriculture Organization (FAO), “in trust” germplasm is maintained in the public domain and is off limits to intellectual property claims. Although US patents on maca do not involve claims on germplasm so far, the patent is predatory on indigenous knowledge of the Andean people, and could have negative impacts on Peruvian exports.

CIP has an opportunity to take a pro-active role in safeguarding maca and traditional knowledge by blowing the whistle on predatory patents, and insuring that Peruvian authorities are aware of intellectual property claims that could endanger one of the region’s “lost crops.”

CIP could follow the example of its sister institution in Colombia, the International Center for Tropical Agriculture (CIAT), which has formally challenged a US patent on Mexico’s yellow bean.

### ***Maca Mockery***

Contrary to what the World Intellectual Property Organization and others are promoting, patent regimes are incapable of recognizing or rewarding the traditional knowledge and informal innovations of indigenous people. Poor farmers in the Puna highlands of Peru are not able to pay hundreds of thousands of dollars to win and defend patents as a means of protecting their knowledge and resources. Even if they did pursue intellectual property, US patent laws will continue to encourage enterprises to isolate, purify, or modify already-existing biological products and processes to win monopoly patents on someone else’s innovation.

“Pure World Botanicals may have done nothing illegal in the eyes of the US Patent and Trademark Office and the company will likely claim that it has followed the letter of the law. Nevertheless, patent claims on maca are morally unacceptable and they make a mockery of the idea that access and benefiting regimes, such as the Andean Community’s Decision 391, or WIPO’s efforts to promote intellectual property, can be used as tools to protect indigenous knowledge and resources,” said Hope Shand, Research Director of ETC group.

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***The coalition of Peruvian organizations that are protesting the maca patents include:***

Quechua-Ayamara Association for Sustainable Livelihoods (ANDES Cusco)

Confederación Campesina del Peru (CCP) Peasant Farmer Federation of Peru

Asociación Nacional de Productores Ecológicos de Peru (ANPE); National Association of Ecological Producers

Federación Departamental de Campesinos del Cusco (FDCC); Federation of Peasant Farmers of Cusco

Asociación Regional de Productores Ecológicos del Cusco (ARPEC); Regional Association of Ecological Producers of Cusco

Federación Revolucionaria Tupac Amaru – Cusco (FARTAC)

Asociación de Productores Ecologicos de la Región Centro (APEREC Huancayo, APEREC Zona Pazos, APEREC Huancavelica)

Red Alternativa de agricultura Agroecológica (CHIRAPAQ-RAAA Ayacucho)

Unidad de Comunidades Campesinas de la Sierra Central (UCSICEP Huancayo)

Asociacion Intercultural para el Desarrollo (AIDAAP); Intercultural Association for Development

ARPIS

Asociacion Peruana de Fitofarmacia (APF)

Pro-Biodiversidad de los Andes (PROBIOANDES)

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<sup>1</sup> G. Li, U. Ammermann, C. Quiros, *Economic Botany*, 55(2), 2001, p. 255.

<sup>2</sup> International Board for the Protection of Genetic Resources (IBPGR), 1982. Cited in *Lost Crops of the Incas*, Report of an Ad Hoc Panel of the Advisory Committee on Technology Innovation, Board on Science and Technology for International Development, National Research Council. National Academy Press, Washington, D.C. 1989, p. 58.

<sup>3</sup> *Lost Crops of the Incas*, p. 58.

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<sup>4</sup> Quiros, C. and R. Cardenas. "Maca," in *Andean Roots and Tubers: Ahipa, arracacha, maca and yacon*, edited by M. Hermann and J. Heller, Rome: International Plant Genetic Resources Institute, 1997, p. 185.

<sup>5</sup> The PureWorld patent, US 6,267,995, has 3 equivalent applications: AU3864900, EP1180006, and WO0051548.

<sup>6</sup> <http://www.pureworld.com/company>

<sup>7</sup> Qun Yi Zheng, PureWorld Botanicals, telephone communication with Hope Shand, ETC Group, May 2002.

<sup>8</sup> Pure World Botanicals, Inc. "Pure World Botanicals launches MacaPure," on the company website:  
<http://www.pureworld.com/news/maca.html>

<sup>9</sup> <http://www.pureworld.com/company>

<sup>10</sup> Carlos Quiros, email communication with Hope Shand, ETC Group, May 23, 2002.

<sup>11</sup> Centro Internacional de la Papa (CIP), 1998 Annual Report, "Lost crops" begin finding markets." Available online:  
<http://www.cipotato.org/market/ARs/Ar98/Lostcrop.htm>

<sup>12</sup> Chauvin, L. "Peru's Natural Viagra Leads List of Unusual Crops with Potential," *Miami Herald*, January 11, 1999, p. 13.

<sup>13</sup> Michael Hermann, CIP, email communication with Hope Shand, ETC Group.

<sup>14</sup> Ibid.

<sup>15</sup> This information is available on the CGIAR System-Wide Information Network for Genetic Resources, available online:  
<http://singertk.cgiar.org>

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