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Biopiracy – RAFI's Sixth Annual Update

Captain Hook, the Cattle Rustlers, and the Plant Privateers: Biopiracy of Marine, Plant, and Livestock Continues

The (Mis)Stakes: In 1999, RAFI and Australian Heritage Seeds Curators Association (HSCA) issued "Plant Breeders' Wrongs," a report documenting systemic, government-sanctioned biopiracies. Rather than cleaning up their act, national patent offices and international conventions such as the World Trade Organization (WTO), the World Intellectual Property Organization (WIPO), and the Union for the Protection of New Varieties of Plants (UPOV) have remained silent. This BioPiracy Update, the sixth since RAFI coined the term in 1992, shows that piracies are on the increase and governments are doing nothing useful about it. From Chiapas to the Punjab, the state sanctioned and supported abuses hover between the ridiculous (a patent on a traditional Mexican yellow bean bought by an American in Mexico) and the outrageous (a US patent on Basmati, the "crown jewel" of Asian rice). The biopirates' booty includes staple foods, livestock, marine species, and medicinal plants. These cases demonstrate the power of exclusive monopoly patents to disrupt and distort domestic and international markets for Southern farmers, and to appropriate the innovative genius of indigenous peoples and rural societies.

At Stake: Corporations and OECD countries are investing hundreds of millions of dollars in the "bioprospecting" and assay analysis of biomaterials. The products arising from their explorations sell for billions of dollars every year.

Stakeholders: People in the South are missing the financial benefits that should rightfully come from the exploitation of their sovereign resources and the commercialization of their indigenous knowledge. They are also being pressed into a system that forces them to pay royalties and monopoly prices for access to the pirated bioresources. The "steak-eaters" here are not only the Gene Giants, but include major governmental and academic research institutions. Biopiracy also attracts penny ante privateers who come into a community to pilfer, patent, and then sell their "inventions" to larger enterprises.

State Stakes: The Biodiversity Convention must make biopiracy a major issue at Fifth Conference of the Parties (COP V) being held May 15 - 26, 2000 in Nairobi, Kenya. In addition, the long-overdue review of the WTO's Article 27.3(b) on Trade-Related Aspects of Intellectual Property Rights (TRIPs) is probably the most important forum for halting patent fraud. The requirement to permit intellectual property for plants and microorganisms should be rescinded on the grounds that it encourages predatory practices against the knowledge of farming and indigenous communities and their governments. Biopiracy should also be challenged within WIPO and UPOV where no constructive action has been forthcoming despite the manifest evidence of wrongdoing. It is ironic that WIPO and some governments are reacting to piracy by proposing standard or *sui generis* patent and Plant Breeder Rights (PBR) regimes. These regimes will only camouflage the crimes while creating the illusion that the rights of community innovators can be safeguarded by the system that is robbing them.

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Last year RAFI and the Australian Heritage Seeds Curators Association (HSCA) released a report entitled *Plant Breeders' Wrongs*, documenting 147 suspected cases of institutional biopiracy. Industry representatives, patent offices and Plant Breeders' Rights officials from Canberra to Geneva dismissed the charges, asserting that plant intellectual property abuses are isolated cases. The International Association of Plant Breeders for the Protection of Plant Varieties (ASSINSEL), for instance, argued that abuses to the system represent a mere 0.45 percent of all Plant Breeders' Rights granted over the past five years, and only 0.15 percent of the samples distributed by the centers in the Consultative Group on International Agricultural Research (CGIAR). The absurdity of these number is clear given that the RAFI and HSCA study focused primarily on 118 Australian claims which amount to 6 percent of all applications made to the Australian PBRO since the legislation was adopted in that country. The PBR violations were those which were clearly visible, based on available documentation — a more in-depth and well funded study would likely uncover many more violations.

The reality is that the cases highlighted in this Communiqué are only the most recent examples of a long line of abuses of "systemic biopiracy." Mexican beans, South Asian basmati, Bolivian quinoa, Amazonian ayahuasca, West Africa's sweet genes - all have been subject to intellectual property claims that are predatory on the knowledge and genetic resources of indigenous peoples and farming communities.

This RAFI Communiqué offers a taste of the biopirates fare with highlights of recent examples and updates of blatent cases of biopiracy. The cases illustrate the inadequacy of existing intellectual property systems in protecting the rights of farmers and indigenous peoples over their knowledge and biodiversity. The current systems do not protect the interests of community innovators, and ultimately threaten conservation and improvement of biodiversity worldwide.

With this issue we also include the winners of the ***Captain Hook Awards***. The Awards were conceived by the Coalition Against Biopiracy (CAB) in Jakarta in 1995. For a number of years, the CAB has been accepting nominations that single out foremost aspirants for the coveted Captain Hook Biopirate Titles and are now ready to present the awards. The awards include a runner-up category for outstanding achievement in the appropriation of genetic resources.

The CAB is a coalition of civil society organizations including IPBN (Indigenous People's Biodiversity Network), SEARICE (South East Asian Regional Institute for Community Education), RAFI, and many local and regional organizations with which they work. The coalition works to ensure that issues of concern to farming communities (including indigenous knowledge and Farmers' Rights) will be advanced within intergovernmental fora. The ***Captain Hook Awards*** will be presented at a ceremony at the Fifth Conference of the Parties to the Convention on Biological Diversity (COP V) being held in Nairobi, Kenya in May 2000.

Pirates on the High Seas: More Marine Biopiracy

The plunder and patenting of marine life has not abated since RAFI last reported on the problem. Coral and sea creatures throughout the tropics have continued to prove profitable for many patent seekers. Most of these marine collections are taking place within the sovereign territory of countries, often without the proper authority. Tambuyog Development Center (a Philippine Civil Society Organization [CSO] working on marine ecosystems in Central Visayas and Mindanao and a partner with the South East Asian Anti-Biopiracy

Program coordinated by SEARICE) has been actively documenting cases of marine biopiracy. According to Tambuyog, many of the specimens collected by bioprospectors come directly from local and indigenous people in the region who provide the prospectors with important knowledge about these resources. Tambuyog has uncovered a number of questionable bioprospecting projects involving marine organisms, including work by University of California researchers who are active in many areas of the world, including the Philippines.

Skin Diving for Profits: University of California researchers "discovered' and patented a potent anti-inflammatory agent, called pseudopterosin, which they found in a Caribbean (the nation state is not identified by the "inventors") sea whip (*Pseudopterogorgia elisabethae*). The compound, developed in conjunction with a professor of pharmacology at the University of California, Santa Barbara, has already been incorporated into a skin cream currently marketed by international cosmetic giant Estee Lauder in a product line called "Resilience." In the past two years, this one application of the agent has generated average yearly royalty income of well over US$750,000 for the University.[1] The same compound has also been licensed to OsteoArthritis Sciences Inc, and to Nereus Pharmaceuticals. In all, the royalties received by the University of California for patented *pseudopterosins*, not including the Estee Lauder license, is in the millions.

Another rare sea creature worth its weight in gold is called *Diazona chinensis*. Working on a National Cancer Institute grant, researchers at the University of California-Santa Cruz have collected samples of the creature. An additional US$500,000 was pumped into the research by The American Cancer Society in order to allow the scientists to further synthesize the compound.[2] Once again, the "inventors" tactfully avoid identifying where they collected their germplasm or whose knowledge led them to the patent.

Researchers at the University of California's Scripps Institute of Oceanography have also been busy collecting marine life through a number of public grants, including funding for collaborations with commercial partners. Marine chemists at Scripps have isolated a chemical from a rare species of coral called eleutherobin, now patented and licensed to Bristol-Myers Squibb. The compound appears to prevent cells from dividing, and is thought to be an important tool in fighting solid cancer tumours. Another compound (*manoalide*), extracted by Scripps scientists from a sea sponge, is the subject of 30 patents by the University of California. The compound has been licensed to Allergan Pharmaceuticals for developing a treatment for psoriasis.

The (Ocean) Bottom Line: Of the top 150 prescription drugs in the USA, only two utilize compounds isolated from marine organisms. In a survey of 20 major bioprospecting enterprises, however, it was found that the companies collected about 17 percent of their samples from marine ecosystems and that enthusiasm for the potential of maritime organisms is growing. Companies and collectors like to think that anything salvaged from the sea is fair game — that no indigenous knowledge or national sovereignty need be sought or assigned. This is hardly the case. As much as rural and indigenous communities have developed drugs and other useful inventions from plants, animals, insects and soils it stands to reason that since the majority of humanity lives along seacoasts and waterways and have depended upon marine life for food, they have also experimented with marine resources for medicines and other non-food purposes. Experience teaches us that the "wild" or "uncultivated" are not necessarily unresearched. While it is in the interests of biopirates to claim that they have discovered or invented that which they have never seen before, they must prove this to be true. In the absence of proof, the Biodiversity Convention—and patent regimes—must assume that any material within the reach of human hands has been discovered, described, and developed by one or more

communities. To assume otherwise is to sanction piracy.

Scripps Gets Scrappy with their "Partners"

In the Philippines, legislation regulating the removal of biological resources from the country is among the most comprehensive in the world. SEARICE lobbied hard for the adoption of this access legislation and their partners, including Tambuyog have been active in ensuring that the legislation is upheld.

The attempt by the Philippines to control access to and promote benefit sharing from its biodiversity through Executive Order 247 (E0247) angered some marine researchers accustomed to easier access to these resources. When EO247 came into place it apparently caused some holdups with ongoing collection activities that Scripps was engaged in as part of a collaboration with Bristol Myers Squibb (BMS), one of the ten largest pharmaceutical enterprises in the world.

In an effort to comply with the new legislation, the Philippine groups working with Scripps proposed a new Commercial Resources Agreement (CRA). The Director of the Scripps Institute, William Fenical in an angry letter dated 18 May 1998 (obtained by Tambuyog) to his Philippine 'partner' at Silliman University's Marine Laboratory, makes clear his allegiance to the pharmaceutical company. "First, let me say that I am very concerned that the Government of the Philippines has decided NOT to honor our previous CRA which is clearly a binding contract. This behavior is outside international Law! Furthermore, we have only now been notified of this change, and find ourselves unable to remove our collected specimens from the Philippines. This is unreasonable behavior and does not show the government support we were offered. Surely, the new CRA can only be enforced AFTER we have been properly notified!…There are a few issues in the CRA which I know will not be agreed upon. First, we do not sell products, so asking us to guarantee 5 percent of sales is unreasonable. The agreement is between UCSD and the Philippine units, not between BMS and anyone. We can give 5 percent of our royalties. In the same regard, we cannot "Cause BMS" to make any payments (US$100,000 and US$500,000) to any Philippine Government group. We do not tell BMS what to do under any circumstances."

In response, the Philippine partners had to remind Fenical that the wording, on the subject of royalties in the new CRA was taken, word for word, from the original agreement already negotiated, and agreed to, by Scripps.

Where's the Beef? Livestock Biopiracy

Zimbabwean Tuli Cattle Moo-ve to Australia: Pirates are adding to their booty not only through plant genetic resources, but also through the removal of livestock germplasm from the South. A controversy is brewing over African cattle, which have become important additions to the cattle market in Australia and have led to valuable new breeds of cattle without any benefit being returned to the countries that developed the breeds.

In 1987, a joint venture between the Commonwealth Scientific and Industrial Research Organization (CSIRO) — an Australian government agency — and a consortium of Australian producers (known as the Boran and Tuli Producers Consortium), collected Tuli embryos from Zimbabwe (and Boran from Zambia). The embryos were quietly taken to Cocos Island in 1988 where they were implanted into surrogate dams. In 1990, live calves landed in Australia. Andrew Mushita, Executive Director of CommuTech, a CSO addressing collective rights issues in Southern Africa, and Regional Chair of the Community Biodiversity Development and Conservation Programme (CBDC), has been closely following the issue in Zimbabwe. "Officials in Zimbabwe are offended and outraged by the Aussie move," says Mushita about the events surrounding the removal and use of the cattle from Zimbabwe, "and are particularly anxious to salvage the surviving herd in Zimbabwe."

The Tuli were developed from the Tswana people by the Government of Zimbabwe using 20 cows and a bull bought from these local people in the lowland region of Southern Zimbabwe in 1945. These animals formed the

basis of the breed developed at the Tuli Breeding Station. The government initially developed the breed to assist in improving stock of African farmers in the outlying areas of Zimbabwe, but the potential was quickly realized by the commercial farmers (European) and for many years the breed was sold to them.

The Tuli breed brings significant advantages to the Australian beef industry. The breed combines high fertility, a docile temperament and excellent beef characteristics with high levels of resistance to the environmental stresses that exist in Zimbabwe (and many parts of Australia). Those involved in the transfer of the germplasm to Australia are clear about the benefits of the African stock. Mr. Frank Luck, Chairman of the Boran and Tuli Producers Consortium, believes that beef producers will now have the necessary broad genetic base available to enable them to produce a range of animals and capitalize on market requirements. "…African Bos taurus (Tuli) and Bos indicus breeds have new characteristics to bring to the northern industry without any loss of adaptation."[3] Dr. John Frish, a spokesperson for CSIRO, also sings the praises of the breed. "British breed cows mated to Tuli bulls have a low incidence of calving problems. Their crossbred calves have higher survival and higher growth than the straight bred British calves with no loss of reproductive potential or meat quality."[4] Many commentators also praise the excellent meat quality attributes of the breed, with studies demonstrating that the meat quality on the Tuli even surpases that of the well-known Angus breed.

Real Bull! How much are they worth to Australia?: It is difficult to estimate the exact value of the Tuli to the Australian beef industry, particularly since they are used for cross breeding. Geoff Ryan, an officer in the Australian Quarantine and Inspection Service indicated in October 1999 that because relatively few Tuli have been introduced into Australia, he doubted that the value of these breeds could be calculated. However, there are some indications of their potential value.

In 1993, Dr. Stocker, the CEO of CSIRO stated that "The introduction of these breeds could lift production [of national herds] by up to 30 per cent."[5] To put this in context… the Australian beef industry is worth US$2.4 billion dollars per year. They are the largest red meat and livestock exporter in the world, producing 1.8 million tons of production with 62 percent of production available for export.[6]

Germplasm Hoofing it from Australia to Argentina: The Australian consortium is now selling the embryos on the Australian and world markets. In May of 1994, just a few days after the Biodiversity Convention meeting in Nairobi wrapped up its final preparatory session leading to COP I — a meeting where germplasm piracy was a dominant theme — the second Boran and Tuli pure-bred embryo sale was held in Australia. The Tuli embryos were in demand and a new world-record price was set at US$5,500.00. Further, in 1994, during a sale of purebred 2 - 3 year old Tuli Bulls offered for sale in Australia, the Consortium also revealed that: "Semen and embryo sales have exceeded expectations with heavy demand from the Americas."[7] It appears that the Australians are selling purebred embryos from Zimbabwe to countries in the Americas! At the same time, the consortium revealed that "successful selective breeding using African Boran and Tuli breeds and an adapted Bos Taurus breed called ADAPTAUR is already attracting attention in the beef industry."[8]

The Bottom Line - Don't Purloin the Sirloin: According to FAO's Commission on Genetic Resources for Food and Agriculture, rare livestock breeds are disappearing at the rate of five percent per year. As a major livestock and animal product exporter, Australia should be working to conserve diversity rather than merely to exploit its demise. It seems likely that Australia broke no laws in removing Tuli and Boran

embyos from Zimbabwe and Zambia. The removal took place four years before the adoption of the Biodiversity Convention and six years before COP I. Nevertheless, those familiar with the case in both Zimbabwe and Australia concede that the removal was undertaken with as low a profile as possible. Zimbabwe officials insist that the Australians were aware that the embryo transfer would have been opposed had the Harare authorities been aware of the plan. Others familiar with Aussie antics say that at least two similar removals took place in the Middle East involving commercially-important sheep breeds. In each case, germplasm was spirited out of the country of origin with as little fuss as possible. In at least one case, the country of origin is now buying the germplasm back from Australia. The legal and moral issues surrounding the removal of the germplasm to Australia should be negotiated at the upcoming Conference of the Parties to the Convention on Biological Diversity in Nairobi, Kenya, May 15-26, 2000.

If Tuli and Boran breeds boost Australian beef, then the African countries should receive a commercial proportion of the value-added market. If the commercial gain is $800 million per annum, then—at minimum—the two countries should earn five per cent, or $40 million, per year. Until that commercial benefit is fully realized, Australia's aid programme should be maintaining the native herds in their home countries and financing their further local development. To do anything less would mean that Australians are the beneficiaries of foreign aid to Zimbabwe and Zambia. Certainly the two countries are giving the Aussies far more value than they are currently receiving in aid from that country.

More Plant Biopiracy

Bitter Biopiracy from West Africa's Sweet Genes

University of Wisconsin scientists are now making money from their patents on "brazzein" a super-sweet protein extracted from the berries of a West African plant, *Pentadiplandra brazzeana.* (RAFI first reported on brazzein in 1995 – see *RAFI Communiqué*, "Biopiracy Update: A Global Pandemic," Sept-October, 1995). The Wisconsin scientists "discovered" the super-sweet berries in Gabon, where local people have known and consumed the berries for many years. Despite being the inspiration and origin for brazzein, neither Gabon nor its people will share the benefits.

University of Wisconsin scientists won four US patents on the brazzein protein between 1994-1998. They were the first to isolate, sequence and synthesize the DNA encoding for the production of *P. brazzeana's* sweet protein. The breakthrough in synthesizing the brazzein protein, and the ability to produce it in high-tech laboratories, essentially eliminates the need for *P. brazzeana* to be collected or grown commercially in West Africa as a source for the super-sweet protein.

University of Wisconsin's Exclusive Monopoly Patents on West Africa's Sweet Genes
US Patent No. 5,741,537 – April 21, 1998
US Patent No. 5,527,555 – June 18, 1996
US Patent No. 5,346,998 – September 13, 1994

Brazzein is reportedly 2,000 times sweeter than sugar, a quality that makes it highly desirable as a natural, low-calorie sweetener. Corporate interest in brazzein is strong. The low-calorie, dietetic sweetener market represents a wholesale value of US$1.4 billion worldwide.

Several multinational companies have already licensed the brazzein technology from Wisconsin, but the University will not disclose the names of the businesses, or the licensing fees. NeKtar Worldwide, a small company based in Texas, bought exclusive rights for the use of brazzein as an extracted sweetener. Working with biotech company ProdiGene, NeKtar hopes to extract large quantities of the low-calorie sweetener from maize that has been genetically modified to express the super-sweet protein.

"We expect to extract one kilogram of Brazzein from a ton of corn processed. This doesn't sound like much until you realize that this equates in sweetness to at least 1,000 kilograms of sugar," said Jim Eckles, CEO of Nektar Worldwide. "High fructose corn syrup (HFCS) is the leading sweetener in the United States today, and this technology could produce a new [sweetener] with twice the sweetness without adding calories."

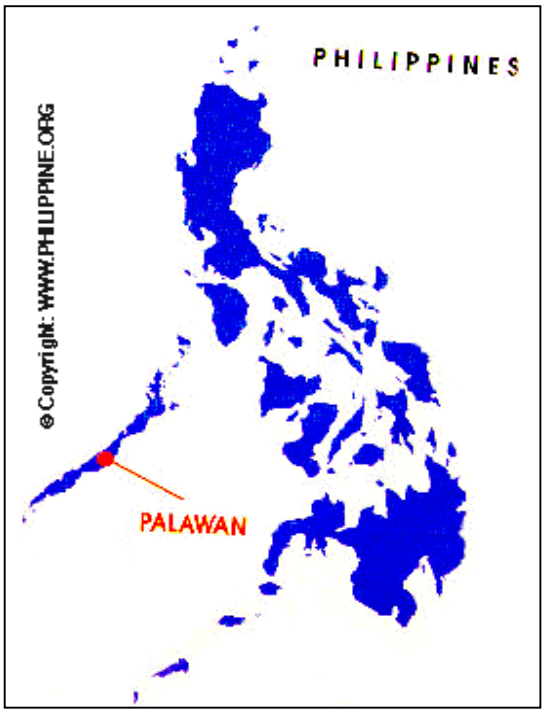
NekTar says that they have successfully modified maize to express super-sweet genes, but a commercial product is still 3-4 years in the future.

The Bottom Line - Getting Fat on Smaller Bottoms! A recent WHO survey shows that US teenagers are overweight, under-exercised, and (perhaps appropriately) paranoid about their health. The solution is not to let kids stuff their faces with more pastries even if brazzein means they will gain less weight. The solution is to change lifestyles. The University of Wisconsin's recipe will put traditional sugarcane and sugarbeet growers on a diet (if not cause outright starvation) while they themselves get fat on the genius and indigenous knowledge of West African communities.

This issue is less of benefit-sharing than it is one of equitable trade practices. West Africa has a right to protect and benefti from its indigenous resource and knowledge. Sugar growers around the world (including beleaguered sugarcane workers in the US) have a right to protection as they adapt to a potentially profound technological change. The WTO, UNCTAD, the Common Fund on Commodities, FAO and the CBD all have a role to play here. First and foremost, however, Wisconsin's wrongful patents should be withdrawn.

Plundering Palawan's Plants

In the Palawan region of the Philippines, researchers at the University of Illinois at Chicago (UIC) have been involved in a project aimed at exploiting pharmacologically important diversity in the region. The Palawan NGO Network, Inc. (PNNI), which is a partner in the Anti-Biopiracy Program, has been actively tracking the activities of the UIC team. The UIC team is particularly interested in a plant, known as *Dichapetalum Gelonloides*, which they believe possesses significant anti-cancer pharmaceutical properties.



Patent Plunder: The UIC project, funded by the MacArthur Foundation and the National Cancer Institute, is working with national partners, including the Philippine National Herbarium of the National

Museum, the University of the Philippines, and the Palawan Council for Sustainable Development (PCSD). The Memorandum of Agreement (MOA), signed by the partners, leaves no doubt about the importance to the project of patenting Philippines' genetic resources. Researchers are expected "to take measures accordingly that would include filing a patent protection on the invention (discovery) namely on the potential use of the said compound as a drug to treat cancer and the licensing of the patented invention." The Philippine organizations are responsible for ensuring that the appropriate permits are issued and for sending out the samples and the compounds as well as to "secure prior informed consent from Palawan." Prior informed consent of local communities is one of the Philippine government requirements of Executive Order 247, established to curtail biopiracy. However, PNNI has been unable to determine whether the UIC project has received any prior informed consent from the people in the region.

Royalties: Gold or Gilt? UIC intends to license the invention to a pharmaceutical company and to share benefits with its partners. These benefits will be disbursed through a trust fund established and administered by UIC.

Promises, Promises: Real Percentage of Royalties Flowing to Philippines

	Philippine Trust Fund	Royalties to Inventors	Funds for Institutions
On Paper	47%	14.5%	4.5%
In Reality	2.3%	0.73%	0.23%

Following Philippines legislation, the partners have established a "benefit sharing" agreement laying out how royalties arising from the licensing of the compound to a pharmaceutical company would be shared. While the agreement appears to provide the Philippines partners with substantial benefits, the numbers represent the percentage of royalties negotiated by UIC from the pharmaceutical company, not the percentage of royalties overall. As a result, if UIC were to negotiate five percent of royalties, the actual share of royalties going to the Philippine partners would be less than three per cent. Further, because the project royalties are controlled by UIC, administrative charges on the royalties will likely further lower the amount to the Philippines.

The bottom line: The UIC must ensure that any collection is done with the prior informed consent of the indigenous groups in the area before collection commences. Further, these groups must be informed that whatever the benefit sharing arrangement agreed to, for the most part, these royalties only exist on paper and may never materialize or may only materialize in the far distant future. Typically source countries receive less then three percent of net royalties and often receive less than one per cent. RAFI knows of no local community that has ever actually received any royalty benefits.

Mexico's Border Jumping Beans

In the spring of 1999 Larry Proctor, owner and president of POD-NERS L.L.C., a small seed company, won both a US patent (No. 5,894,079) and a US Plant Variety Protection Certificate (No. 9700027) on the Enola bean. The patent claims exclusive monopoly on any *Phaseolus vulgaris* (dry bean) having a seed color of a particular shade of yellow.[9] POD-NERS is now suing Mexican bean exporters charging the Mexican beans they are selling in the US infringe their US patent on a the yellow-coloured bean variety.

POD-NERS is demanding royalties of six cents per pound on the yellow beans entering the US from Mexico. Because of the patent infringement charges, US customs officials are now inspecting Mexican beans at the US-Mexico border. According to Rebecca Gilliland, President of Tutuli Produce, one of the

companies being sued, US customs officials are taking samples from every shipment, at additional cost to her company. And because of the lawsuit, Gilliland says her company is already losing customers — and important markets for Mexican farmers, the real victims of this patent.[10]

***Mexico Defends its Bean Heritage*:** Outraged by the appropriation of Mexican germplasm and legal attempts to block Mexican bean exports to the US, the Mexican government announced in early January that it would challenge the US patent on the 'Enola' bean variety. 'We will do everything necessary, anything it takes, because the defense of our beans is a matter of national interest,' declared Jose Antonio Mendoza Zazueta, under-secretary of Mexican rural development.[11] The patent challenge will cost at least US$200,000 in legal fees.[12]

Nothing New: Larry Proctor, the 'inventor' of the bean admits having bought the original bag of commercial beans in Mexico before doing selection work on them. But Proctor claims that the Enola variety he developed is unique because of its distinctive yellow color and also because it was not grown previously in the US.[13]

Plant breeding experts disagree. Professor James Kelly, a bean breeder at Michigan State University and President of the Bean Improvement Cooperative, believes that the Enola patent is 'inappropriate, unjust and is not based on the scientific evidence or facts'.[14] 'This yellow color described in the patent is typical of the yellow beans that have been grown for centuries in Mexico. The yellow beans in Mexico are widely grown and known under the names of Mayocoba, Azufrado, Sulfur, Peruano, Canaria and Canario, names that are all suggestive of the yellow color'.[15] Professor Kelly dismisses the implication that the patented yellow bean was not known, grown or recognized in the US prior to 1994. Documented evidence shows that yellow beans (of Mexican origin) similar to Enola were grown and consumed in the US as far back as the 1930s.[16] Further, Mexico's National Research Institute for Agriculture, Forestry and Livestock (INIFAP) recently conducted a DNA analysis of POD-NERS' patented bean. The results indicate that the Enola variety is genetically identical to Mexico's 'Azufrado' bean.[17]

RAFI's initial database search reveals that scores of Mexican bean varieties identified by those names are held by the International Center for Tropical Agriculture (Cali, Colombia), and virtually all of them are designated 'in-trust' materials. Under the terms of the 1994 agreement between the Consultative Group on International Agricultural Research and the UN Food and Agriculture Organization, 'in trust' germplasm is maintained in the public domain and is not allowed to be included in any intellectual property claim.

The bottom line: The Enola bean patent is technically and morally unacceptable. It is tragic that Mexico is now forced to devote scarce financial resources to challenge a patent that should never have been granted. Another perverse effect of the patent is the reaction by the Mexican government to patent and PBR every plant in sight. In doing so, they place the very same predatory IP regimes that undercut the rights of farmers to save seeds, promotes genetic uniformity, and threatens food security. In this case, it's difficult to decide who is more at fault: Is it the patent owner or is it the US patent examiners who determined that Proctor was eligible to win an exclusive monopoly patent?

Ayahuasca Patent Rejected – Victory for Amazonian Indigenous Peoples

In 1995 RAFI disclosed that Loren Miller, a US citizen, had obtained a patent under the US Plant Patent Act on *Banisteriopsis caapi* (patent #5751), a plant species native to the Amazon rainforest. Popularly known as the Ayahuasca vine, the plant is used in sacred indigenous ceremonies throughout the Amazon, where it is well-known for its medicinal and hallucinogenic properties.

In November 1999 the US Patent and Trademark Office (US PTO) rejected the ayahuasca patent. The PTO's decision came in response to a request for reexamination of the patent in March 1999 by the Washington DC-based Center for International

Environmental Law (CIEL), on behalf of the Coordinating Body of Indigenous Organizations of the Amazon Basin (COICA) and the Amazon Coalition. The groups requested that the patent be cancelled "because the claimed patent lacks novelty and distinctiveness, is found in an uncultivated state, and is a sacred element of many indigenous cultures of the Amazon should not be subject to private appropriation."[18]

Loren Miller is appealing the PTO's decision to reject his patent. He must supply arguments and evidence to counter the PTO's decision. According to CIEL attorney, Glenn Wiser, "It will be a very tough hurdle for Miller to cross."[19]

In response to the PTO's cancellation of the ayahuasca patent, CIEL attorney David Downes observed, "we are concerned that the PTO still has not dealt with the flaws in its policies that made it possible for someone to patent this plant in the first place…the PTO needs to change its rules to prevent future patent claims based on the traditional knowledge and use of a plant by indigenous peoples." [20]

In separate proceedings at the PTO, the three groups have called for changes that would require that PTO patent applicants identify all biological resources and traditional knowledge that they used in developing the claimed invention, disclose the geographical origin of the claimed biological resources, and provide evidence that the source country and indigenous community consented to its use.

Basmati Rice Patent Update

The following update on RiceTec's Basmati patent was released jointly by RAFI, The Berne Declaration and the Gene Campaign in January 2000, the full text can be found as a Geno-type at www.rafi.org**.**

In September 1997 a Texas-based company, RiceTec Inc., won a controversial US patent (No. 5,663,484) on Basmati rice lines and grain. RiceTec's Basmati patent has become widely known as a classic case of 'biopiracy.' Not only does the patent usurp the Basmati name, it also capitalizes on the genius of South Asian farmers who have for centuries selected and maintained Basmati rice varieties that are recognized worldwide for their fragrant aroma, long and slender grain and distinctive taste.

Basmati is known as the 'crown jewel' of South Asian rice commanding a premium price in both domestic and international markets. Approximately one million hectares in India and 0.75 million hectares in Pakistan are planted in Basmati varieties, where it is cultivated by an estimated two million small farmers.[21] In India alone, Basmati exports were valued at approximately US$425 million in 1998/99; but export markets could be threatened if forced to compete with RiceTec's Basmati.[22]

Although a relatively small company based in the US, RiceTec boasts a royal lineage. The reigning billionaire Prince Hans Adam II of the principality of Liechtenstein is sole owner of RiceTech Inc. In May 1998 RAFI launched a Basmati postcard campaign in an attempt to demonstrate the intense public sentiment against RiceTec's monopoly on Basmati rice. Despite receiving thousands of postcards from all over the world beseeching him to abandon the notorious Basmati patent, Prince Hans-Adam has failed to take action.

In September 1999, Civil Society Organizations (CSOs) organized a personal meeting with Prince Hans Adam. 'We tried to convince the Prince that RiceTec did not 'invent' Basmati rice, and that it is wrong to appropriate the resources and knowledge of South Asian farmers,' said François Meienberg of the Berne Declaration. A number of high profile individuals and groups, including the Rockefeller Foundation, have publicly opposed the patent.

Indian Government Counters Biopiracy: For the past two years, it has been widely rumoured that the governments of India and Pakistan would officially challenge the RiceTec patent. According to Mohan Lal, the Director of India's Department of Industry and Development, the government is determined to fight the RiceTec patent and will soon file a re-examination petition at the US Patent and Trademark Office (US-PTO) based on technical grounds.[23] In 1998, the Indian government appointed an expert technical committee to review the Basmati patent. The committee has compiled and reviewed over 1,500 pages of background information that will form the basis for challenging the US patent.

RiceTec does not waver in defense of its patent, 'We are absolutely confident in our patent and its viability and legality - there's no basis for challenging the patent,' according to Bruce Hicks, spokesperson for RiceTec.[24]

RiceTec's Basmati Losing Ground?: Uncle Ben's, Inc., the largest seller of rice products in the world, is clearly distancing itself from the RiceTec controversy. Alice Nathanson of Mars, Inc., of which Uncle Ben's is a wholly owned subsidiary, told RAFI that 'Although we do have Basmati, it is purchased only from Pakistan and India'.[25] India exports approximately 45,000 tonnes of Basmati to the US annually.[26]

The United Kingdom's Ministry of Agriculture Fisheries and Food (MAFF) recently performed a DNA analysis of Basmati rice concluding that RiceTec's two 'Basmati' style products have a genetic profile with 'much more similarity' to US long grain varieties than South Asian Basmati samples.[27]

In its Code of Practice for rice, the UK's Grain and Feed Trade Association, one of the world's largest importers of Basmati rice, concluded that Basmati rice 'shall only be applied to the long grain rice grown in India or Pakistan'.[28] Similarly, Saudi Arabia — India's largest market for Basmati rice — allows Basmati rice originating only in the Indian sub-continent to be sold as Basmati rice.[29] And a Greek court reportedly rejected a trademark application by RiceTec for rice it described as American Basmati.[30]

The bottom line: It is indecent and unacceptable for the genius of millennia to be usurped by an US-based company (controlled by European royalty). RiceTec's patent is predatory on the rights and resources of South Asian farmers, and it should be abandoned.

Agreeing to Disagree — Or Agreeing to Disappear?

Biopiracy Project in Chiapas, Mexico
(for full text see RAFI Geno-type at www.rafi.org)

Biopirates in search of new pharmaceutical products have also been active. In Chiapas Mexico, eleven indigenous peoples' organizations and their many supporters are demanding that a US$2.5 million, US-government funded bioprospecting program suspend its activities. Despite the protest by local Mayan organizations, the University of Georgia (US) says it will not halt the five-year project, which aims to collect and evaluate thousands of plants and microorganisms used in traditional medicine by Mayan communities.

Collectively known as the Council of Indigenous Traditional Midwives and Healers of Chiapas (Consejo Estatal de Parteras y Medicos Indegenas Tradicionales de Chiapas), the eleven Mayan organizations are denouncing the bioprospecting project, and they are asking other indigenous people in Chiapas to refuse to

cooperate with the researchers. The project is led by the University of Georgia, in cooperation with a Mexican university research center, El Colegio de la Frontera Sur (ECOSUR), and Molecular Nature Ltd., a biotechnology company based in Wales, U.K.

The five-year project 'Drug Discovery and Biodiversity Among the Maya of Mexico,' now in its second year of operation, will receive a total grant of US$2.5 million dollars from the US government's International Cooperative Biodiversity Groups (ICBG). The ICBG is a consortium of US federal agencies, including the National Institutes of Health (NIH), the National Science Foundation (NSF) and the US Department of Agriculture (USDA) that awards grants to public and commercial research institutions that conduct bioprospecting/biopiracy programs in the South.

Using indigenous knowledge to guide its research, the Chiapas ICBG project aims to discover, isolate and evaluate pharmacologically important compounds from the plant species and microorganisms employed in traditional Mayan medicine. Over the centuries, the Maya have developed a rich medical knowledge. An estimated 6000 plant species thrive in the area, thousands of them used by the Maya to treat illness. The project estimates that it will ultimately identify approximately 2000 unique compounds that will be chemically profiled by the project's commercial partner. A duplicate set of plants collected by the ICBG program in Chiapas will be deposited at the University of Georgia's Herbarium in Athens, Georgia.

Local Opposition: The bioprospecting program has outraged some indigenous peoples' organizations in Chiapas who claim that their indigenous knowledge and resources are being stolen. According to Sebastian Luna, an indigenous Tzeltal spokesperson from the Council, 'the project is a robbery of traditional indigenous knowledge and resources, with the sole purpose of producing pharmaceuticals that will not benefit the communities that have managed and nurtured these resources for thousands of years.'

'Furthermore,' continues Luna, 'the project explicitly proposes to patent and privatize resources and knowledge that have always been collectively owned... Besides being totally contradictory to our culture and traditions, the project creates conflict within our communities as some individuals, pressured by the grave economic situation, collaborate with the researchers for a few pesos or tools.'

Luna adds that the project is openly violating the International Society of Ethnobiology's (ISE) Code of Ethics. That code, in its *Principle of Prior Informed Consent and Veto* states: that "the prior informed consent of all peoples and their communities must be obtained before any research is undertaken. Indigenous peoples, traditional societies and local communities have the right to veto any programme, project, or study that affects them…" (The full text is available at: http://guallart.dac.uga.edu/ethics)

RAFI contacted the project's leader Brent Berlin at the University of Georgia and asked if the demands being made by the indigenous peoples' organizations in Chiapas are grounds for suspending the bioprospecting program in Chiapas. Berlin, one of the authors of the ISE's Code of Ethics, rejected the idea. "I'm convinced that that question would not even be asked if these groups were fully informed about the Project."

The Chiapas ICBG program operates on the principle — at least on paper — that the biological samples belong to Mexico and that some undisclosed portion of royalties will flow back to the Highland Maya of Chiapas — via PROMAYA, a non-profit organization set up by the organizations who are running the project. The reality is that long-term benefits may never materialize, and many local indigenous people reject both intellectual property and the process established for benefit-sharing. The critical issue now is that the project is apparently proceeding not only without proper consultation with the affected communities, but also

against the express wishes of a very significant sector of the community.

The Bottom Line: The ICBG and the University of Georgia should withdraw from Chiapas unless and until the communities there invite them to return.

Biopiracy Action

As stated in our Geno-Type of 12/22/1999, "Messages from the Chiapas 'Bioprospecting' Dispute," RAFI has long held the position that exclusive monopoly intellectual property over products and processes constrain innovation and disenfranchise society. RAFI does not believe that there currently exists any adequate mechanism, including the Biodiversity Convention, capable of safeguarding the rights and interests of local communities.

There are legitimate ethical and practical considerations that need to be dealt with by any initiative to commercialize genetic material and local knowledge. Commercialization presumes exclusive intellectual property monopoly over end products and/or processes. Many individuals and communities have moral or religious objections to patents on life. Many are also opposed to genetic engineering. These concerns must be respected and addressed directly in any prospecting negotiation. In our experience, the full evaluation of these issues is a long community-wide process that is almost always dealt with inadequately.

In the absence of effective protocols and regulatory procedures, neither national governments nor intergovernmental treaties are able to guarantee protection from biopiracy. Regulation of these activities is further complicated by the long timelines involved in commercializing these materials and the rapid turnover in corporate identities through acquisitions and divestitures. For these reasons, we believe that unless, and until functioning mechanisms are in place, all bioprospecting agreements jeopardize the right and interests of local communities.

This view should not lead one to the conclusion that the vast knowledge and resources of indigenous and local communities must remain forever fortressed against the needs of humanity. The opposite is true. Traditionally, this knowledge is shared. Only the advent of patent privatization and monopoly has forced the closure to free exchange. Our response has to be to ensure the moral, legal, and regulatory environment necessary for consenting peoples to share their wisdom honourably and equitably for the benefit of everyone.

In the meantime, a number of policy actions are possible, including:

- A systematic study of Biopiracy should be launched at the time of the CBD COP V in Nairobi, May 15 - 26, 2000. In addition, a specific investigation in UPOV should be undertaken to put forward concrete proposals detailing how they will monitor and stop biopiracies. UPOV's Consultative Commission meets October 25, 2000 and the UPOV Council meets Oct 26, 2000. The meetings are held in Geneva.
- At the FAO Commission a case-by-case review of abuses must be undertaken. The next FAO Commission meeting has not yet been scheduled but will probably take place this year.
- Governments should rescind the current requirement under Article 27.3(b) of the WTO TRIPS agreement to permit intellectual property protection for plants and microorganisms on the grounds that WIPO and UPOV regimes are predatory upon the knowledge of farming communities and indigenous peoples and upon the sovereignty of states over their living resources. The next WTO General Council meeting will be held on October 10, 2000 in Geneva.
- Protection for geographical indications for agricultural products should be strengthened at the national level and under TRIPs. The next TRIPS - Council for Trade-Related Aspects of Intellectual

Property Rights - meeting will be held on June 26-30, 2000 in Geneva.

- Patents where 'in trust' germplasm may be involved should be investigated by the FAO and CGIAR and immediate steps taken to defend the in-trust germplasm and ensure its integrity. Under the terms of the 1994 agreement between the Consultative Group on International Agricultural Research and the UN Food and Agriculture Organization, 'in trust' germplasm is maintained in the public domain and is not allowed to be included in any intellectual property claim.
- Governments, civil society organizations and other stakeholders convening at the Global Forum on Agricultural Research in Dresden May 21-23, 2000 should urgently review the impact of plant intellectual property on plant breeding and innovation, farming communities and biological diversity.
- Governments and CSO's should continue to oppose attempts by WIPO to impose intellectual property regimes on traditional knowledge and should encourage exploration of alternative ways to protect indigenous and traditional knowledge.

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[1] *Neergaard, Lauran*. 1998. *The Associated Press*, New York, June 17, 1998.

[2] Cole, Richard. 1997. "Easy Come, easy go, for potential cancer cure." Associated Press, Feb 1997.

[3] CSIRO Media Release, 95/32

[4] CSIRO Media Release, 94/127

[5] CSIRO Media Release, 93/46

[6] Meat and Livestock Australia, Industry Overview

[7] CSIRO Media Release, 94/112

[8] CSIRO Media Release, 94/112

[9] Proctor claims that his patent provides protection for any dry bean having a seed color which is yellow in color from about 7.5Y 8.5/4 to about 7.5Y 8.5/6 in the Munsell Book of Color when viewed in natural light.

[10] Personal communication with Rebecca Gilliland, Tutuli Produce, 13 January 2000.

[11] Lourdes Edith Rudino, 'A proceso judicial, los derechos de propriedad del frijol 'Enola', El Financiero, 10 January 2000.

[12] Lourdes Edith Rudino, 'A proceso judicial, los derechos de propriedad del frijol 'Enola', El Financiero, 10 January 2000.

[13] Personal communication with Larry Proctor, 5 January 2000.

[14] Letter from James D. Kelly, Professor of Crop and Soil Sciences, Michigan State University, to Mr. Humberto Valdivia, Manager, Productos Verde Valle, 15 December 1999.

[15] Letter from James D. Kelly, Professor of Crop and Soil Sciences, Michigan State University, to Mr. Humberto Valdivia, Manager, Productos Verde Valle, 15 December 1999.

[16] Kelly provides documentation from 'Beans of New York,' Vol.1 - Part II of the Vegetables of New York published in 1931 by J.B. Lyon Company, Printers, Albany, NY. This volume contains a detailed description of the sulfur beans and color photos. Kelly says that the book is a valid and accurate catalogue of beans grown and consumed in the United States in the 1930s.

[17] Personal communication with Dr. Marciel Garcia Morteo, INIFAP.

[18] Letter from David R. Downes, Senior Attorney, Center for International Environmental Law, to Todd Dickinson, Acting Assistant Secretary of Commerce and Acting Commissioner of Patents and Trademarks, March 30, 1999.

[19] Personal communication with Glenn Wiser, 3 February 2000 and 14 April 2000.

[20] Center for International Environmental Law, CIEL Press Release, "US Patent Office Cancels Patent on Sacred "Ayahuasca" Plant," 4 November 1999.

[21] Khush, Gurdev S. and Normita de la Cruz, 'Developing Basmati Rices with High Yield Potential,' unpublished paper, presented at UK conference, 1997.

[22] Source: Apeda Agro Exports Statistics and DGCIS, in India Grains, November, 1999;) (For more background information, see RAFI GenoTypes, 'The Basmati Rice Patent,' 1 April 1998, http://www.rafi.org, and Berne Declaration Press Package (in German),'Das Basmati Patent,' 24 September 1999, http://www.evb.ch).

[23] Lal spoke by telephone to Katherine Hay, RAFI consultant in New Delhi. The Indian government s decision to challenge the patent was also confirmed by Dr. E.A. Siddiq, National Professor, Directorate of Rice Research, Indian Council of Agricultural Research, Hyderabad, India, 14 December 1999.

[24] Personal communication with Bruce Hicks, Darcy Communications, spokesperson for RiceTec Inc. on 14 December 1999.

[25] Personal communication with Alice Nathanson, External Relations Manager, Mars, Inc. on 23 November 1999.

[26] The Economic Times, 5 February 1999.

[27] UK Ministry of Agriculture, Fisheries and Food, Final Project Report, 'The development of isotopic analysis and DNA polymorphic markers to determine the geographical and cultivar origin of premium long grain rice,' March 31, 1999, p. 15.

[28] The Grain and Feed Trade Association (GAFTA), 'Rice Standards Section Code of Practice for Rice, 1 January 1992.

[29] Bose, Kunal. 'India to fight US move on basmati rice,' Financial Times (London), 25 February 1998, p. 35.

[30] Shlachter, Barry. 'India, Pakistan Steamed Over So-Called Rice Bio-Piracy by Texas Firm,' Ft. Worth Star Telegram, May 6, 1998.