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Also in this edition: HGDP Rejected, p. 8

Biopiracy Update: The Inequitable Sharing of Benefits

Issue: 169 countries[1] have ratified the legally-binding Convention on Biological Diversity (CBD) in the four years that have passed since it came into force in December 1993. Parties to the Convention are committed to the fair and equitable sharing of benefits arising from the use of biodiversity; but the wave of bioprospecting that has enveloped the South - propelled in large part by the CBD's promotion of bilateralism - has confirmed that so far the "equitable sharing of benefits" is rhetoric and not reality. The unjust and exploitative bioprospecting deals taking place today threaten to turn one of the important elements of the CBD into a farce.

Situation: The CBD currently offers little recourse for the South governments, farmers, and indigenous people, who are beleaguered by persistent pressure for access on unfavourable terms. Parties have failed to implement key provisions on community rights over biodiversity such as Article 8(j). Parties have not closed a hemmoraging loophole that allows industry to circumvent benefit sharing by accessing the South's diversity held Northern *ex-situ* collections. The life industry and the US government (which has not ratified the Convention) are using bilateral bioprospecting agreements as their tool of choice to cheaply access genetic resources and undervalue farmers' resources and knowledge. These bilateral agreements actually encourage inequities through patents, secrecy, and imbalanced negotiations that favour companies, not the true innovators and sustainable users of diversity, farmers and indigenous people.

Intermediaries: Groups positioning themselves between the life industry and local communities, such as academics, small bioprospecting companies, and even NGOs continue to facilitate self-serving, bad bilateral deals. These agreements often blur the lines between public and private research, and between conservation and profit-seeking. Farmers and indigenous people have reason for concern about intermediaries that seek to negotiate bioprospecting deals on behalf of communities and then position themselves to receive and manage benefits earmarked for communities' sustainable use of biodiversity.

Action: Parties to the CBD should urgently encourage a truly equitable sharing of benefits from the use of biodiversity by taking action to implement the CBD's provisions on the rights of indigenous and local communities. Concrete steps can be taken at the CBD Workshop on Traditional Knowledge and Biodiversity in Madrid (November 1997), and COP IV in Bratislava (May 1998).

LET'S MAKE A DEAL

US says "10% if it's mine, 2% if it's yours"

Farmers and indigenous peoples haven't expressed much enthusiasm about the paltry royalty rates being offered by bioprospectors. This is for good reason: typical offers are for less than 3% of the profits from products based on indigenous knowledge and resources. And, to our knowledge, there is currently nowhere in the world where communities are receiving royalty payments.

A prime example of the tiny royalties offered in bilateral bioprospecting agreements are the US government-financed International Cooperative Biodiversity Group (ICBG) projects. In the ICBG-Peru Project, indigenous people were offered a low of one quarter of 1% of sales in royalties (the highest possible royalty was about 1%), while Monsanto and Washington University (US) scooped up the rest.[2] Conservation International's ICBG Project in Surinam offers indigenous people a paltry "about 2% or 3%", while pharmaceutical giant Bristol Myers Squibb gets the lion's share.

But the US Government has a radically different attitude when the tables are turned and bioprospectors knock on its door. When Diversa Corporation (US) decided to

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YELLOWSTONE DEAL SLEIGHT OF HAND: COMPANY WANTS GENES, NOT BIODIVERSITY

To work around a US legal prohibition on the patenting and commercial exploitation of national park resources, the National Park Service and Diversa have agreed to call genes "information" rather than "life". Using this bizarre definition of DNA, the company will go ahead and patent valuable genes found in Yellowstone's microorganisms and then insert them into genetically-engineered industrial unicellular organisms called "microlivestock". They hope the US public won't notice or won't care.

Common sense says reducing genes to information makes no sense at all. Of course life and information are, inseparably intertwined. Life can't be reduced to "information" for patent purposes.

Yellowstone's sleight of hand is more than a cynical ruse to avoid the spirit of the law. The US government's utilization of an artificial life vs. information dichotomy points to deeper problems coming soon: Scientists already have the ability to transfer large sections of chromosomes from one species to another, and are also able to store the entire genetic code for even the most complicated life forms (namely humans) in digital format. Where should the line be drawn between *"ex-situ* biology" on computer disks (or other electronic media), and *"in-situ* biology"?

A Different Species of Intermediary

The World Foundation for Environment and Development

Most groups positioning themselves as intermediaries in bioprospecting agreements act as agents of the group seeking samples or gather resources and knowledge to re-sell to industry. The Diversa agreement has a different kind of intermediary, one paid by owners/custodians of resources to market them and cut deals with industry.

The World Foundation for Environment and Development (WFED), a small Washington-based NGO headed by a patent lawyer, got its own benefits out of corporate interest in Yellowstone in the form of a two year, US $200,000 contract to help the park make bioprospecting deals. The Diversa arrangement is the first of what WFED hopes will be many. But so far, WFED's services will cost the US government US $25,000 **more** than it has earned by selling access to microbes in Yellowstone. WFED is also working on international bioprospecting contracts; but won't say where or who its parters are.

WFED defends its role in the Diversa deal. It says the patent provisions are standardized language from other government coopertative research agreements (though not necessarily agreements involving genetic resources). If people are bothered by the patenting, says WFED, it and the companies it works with aren't to blame - it says critics should complain to the US Patent Office.

collect samples in Yellowstone National Park, the National Park Service negotiated a deal in which Diversa will pay the US government up to 10% of sales in royalties.[3] That's between three and 40 times what US government-funded ICBG projects offer to farmers and indigenous people abroad.

To add insult to the economic injury, the Yellowstone deal doesn't even involve indigenous knowledge. The company is interested in heat-loving microorganisms from geothermal areas. This makes the royalties paid by ICBG and other projects even less appealing since they collect not only seeds, plants, and other farmer-managed genetic resources; but also indigenous knowledge.

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The Yellowstone deal also compares favourably with non-US government-funded bioprospecting efforts. For instance, although official figures have never been released, the royalty rates on future sales paid by Merck for rights to samples collected by Costa Rica's InBio have been widely reported to be 5% or, more likely, less.[4] The up to 100% difference between InBio and the Yellowstone deal is particularly ironic considering the fervor with which promoters - including the US government and World Bank - have touted InBio/Merck as being a "model" for the South.

Diversa's up-front payments to the US government for the rights to the non-exclusive prospecting exceed what ICBG has been willing to pay to indigenous people. Diversa will pay US $100,000 cash plus US $75,000 in technology and services (cash payments deductible from royalties if any).[5] This exceeds what has been paid in deals of a similar scale in the South, for example Bristol Myers Squibb's up-front payment US $50,000 in the ICBG-Surinam project was less than one third of Diversa's.

Proponents of the deal point out that the hot springs in the park are unique and the source of previous microbial discoveries.[6] Therefore, the argument goes, Yellowstone may "deserve" higher royalties because of its unique life and proven potential. But ongoing bioprospecting projects in Southern areas of high genetic diversity and endemism that have also been the source of major products (such as the Eastern Andean slopes or Costa Rica's tropical forests) have not been similarly valued.

John Varley, Yellowstone's Director of Resources, says that while not a model, his park's agreement with Diversa may be indicative of things to come in the US. According to Varley, there is wide research interest in genetic resources in US National Parks including

nurserymen looking for new flowers in the US southwest, and scientists interested in the unique biology of cave-dwelling organisms in the states of New Mexico and Kentucky. The approach Yellowstone has used with Diversa may be replicated in other parks in a move that would likely generate controversy (see box). Indeed, the Diversa agreement has already drawn a lawsuit from two US NGOs: the Edmonds Institute and International Center for Technology Assessment. According to Beth Burrows, the Director of the Edmonds Insitute, the deal is a *"theft of our national heritage... We didn't preserve Yellowstone for corporate purposes."*[7]

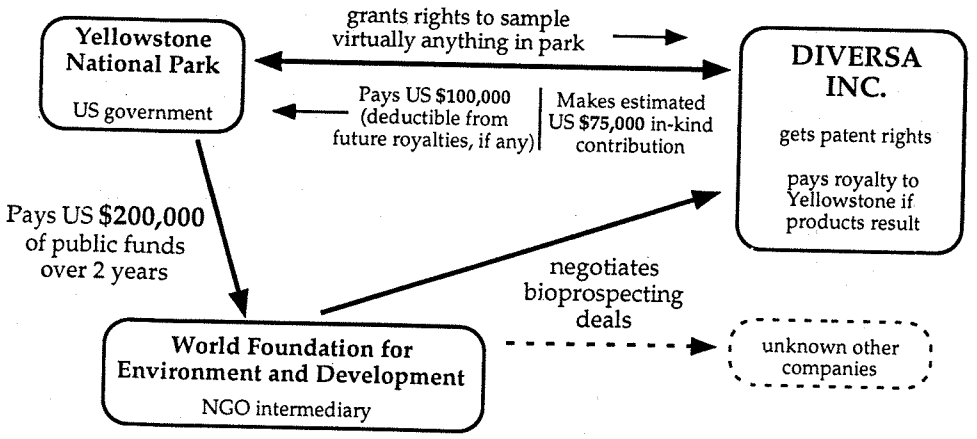
At the international level, the grim reality laid bare by the Yellowstone contract is that biopiracy uses the economic clout of major corporations to apply a double standard. South governments and farmers are being strongarmed into giving up genetic resources and knowledge under extremely unfavourable terms.

The US Department of Agriculture's Foreign Agricultural Service (FAS) has recently joined the US National Institutes of Health as a sponsor of ICBG. FAS and NIH have secured additional funding from the US Congress to send a new wave of ICBG projects into the field. FAS will support new ICBG projects that include collection of agricultural genetic resources and indigenous knowledge.

The royalty scandal can be seen as confirmation of the suspicions of delegates and observers of the Convention on Biological Diversity (CBD), many of whom have long suspected that the US is not serious about the equitable sharing of biodiversity.

Diversa's hunt for microbes and enzymes extends well beyond the US. The company has signed a bioprospecting agreement with Bogor Agricultural University in Indonesia that grants Diversa access to "samples from Indonesian habitats which range from volcanoes to tropical jungles." In the deal, Diversa is providing supplies, equipment, and an undisclosed royalty, while Bogor scientists are doing the sampling.[8] Diversa also reports it has signed agreements in Iceland and Costa Rica and that it is negotiating one in Mexico.

ANATOMY OF THE YELLOWSTONE CONTRACT



"The benefits-sharing structure... assures that the public is not deprived of their rightful share of the publically-owned resource that is being commercialized."

-Yellowstone's deal with WFED

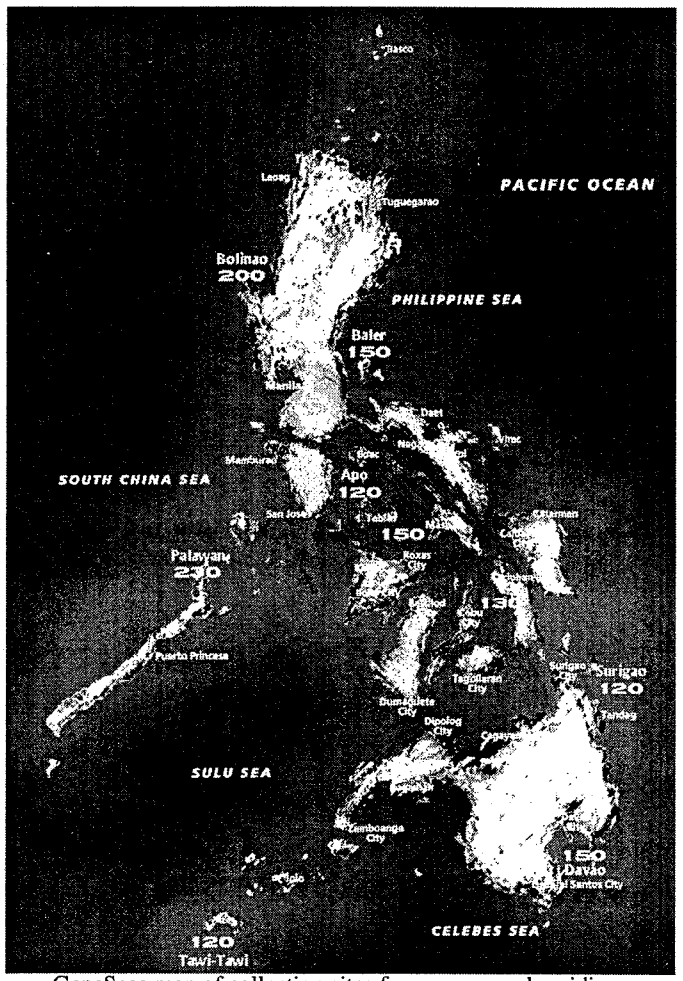
PATENTING MARINE LIFE

Philippine Snails and Fijian Sponges Patented for Pharmaceuticals

The waters of the Pacific have proven rich for patent-seekers. US, New Zealand, Spanish, and Philippine researchers studying marine life - especially sponges and snails - have slapped over a dozen patents on organisms from the Philippines and Fiji. One of the patents, on a Fijian sponge's antitumor properties "invented" by US researchers (US 5,414,001) has wound up in the hands of major life industry multi-national American Home Products (world's 9th biggest agrochemical company, with 1996 sales of over US $14 billion).

US-based Neurex Inc. is staking its hopes on a pain killer it calls SNX-111, a synthetic copy of a toxin which was isloated by researchers from the University of Utah (US) in the venom of the Philippine sea snail *Conus magus*. The snail toxin is reportedly 1,000 times more powerful than morphine. To launch the product, Neurex has raised approximately US $80 million through stock sales and alliances with other companies. According to the US magazine *Worth*, *"the serendipitous discovery of SNX-111 has rescued Neurex from the brink...A snail... may well transform the fragile venture from an obscure sleeper into the little biotech company that could... this snail from a coral reef in the Philippines could help deliver humanity from, literally, one of its most agonizing problems: the problem of severe, intractable pain."*[9]

In addition to claims on SNX-111 as a pain killer, Neruex has patented the use of snail toxins to treat stroke victims in a series of US patents (5,189,020 issued 23 Feb 1993,



GeneSeas map of collection sites for sponges and ascidians

5,559,095 issued 24 Sept 1996, and 5,587,454 issued 24 Dec 1996). International claims have been filed in Australia, Canada, the European Patent Office (for 14 countries), and Japan. WIPO documents indicate Neurex may also seek national patents in Hungary, South Korea, Norway, and Russia.[10]

The company is in the final stage of testing with the Philippine product and, anticipating approval for its sale from the US government, has cut a marketing deal with Warner Lambert, a major international pharmaceutical company with sales of US $ 5.8 billion in the first 9 months of 1997. (The company boasts: *"To put that strength into perspective, this year Warner-Lambert's sales will surpass the gross national product of some countries."*)[11] Neurex has signed another SNX-111 deal with Medtronic, a US company specializing in medical implants with 1997 fiscal year sales of US $2.4 billion.[12] Neurex is also looking at agricultural applications of sea snail toxins and has developed a toxin "library". Neurex is working with American Home Products to try to identify pesticidal applications for its chemical collection.[13] In October, Neurex announced that it had found another pharmaceutical agent, this time in the venom of a Cameroonian spider.

The move to commercialize follows years of research on biomedical applications of sea snail toxins - and a string of patents dating back to the mid-1980s - by researchers from the University of Utah (US). Some of the Utah research team are Philippines citizens and have worked with scientists at the University of the Philippines Marine Science Institute (UP-MSI) in Quezon City. Utah maintains a marine science lab on UP-MSI premises and several researchers involved have academic appointments at both institutions.

To capitalize on the commercial interest in Philippine marine diversity, in June 1997, Utah and UP-MSI researchers formed and financed a Philippine company called Gene Seas Asia. GeneSeas offers the life industry a database on Philippine marine diversity to give its clients *"a competitive edge in the race to develop new drugs."* If GeneSea's library isn't enough for some companies, the company also happily offers: *"Ecologists, SCUBA divers and a 100 ft. live-aboard dive boat are readily contacted for explorations."* Lest any clients have worries about access regulations, GeneSeas boasts *"A thorough understanding of the government's guidelines on Bioprospecting as embodied in Executive Order 247."*[14] Three of the five members of the GeneSeas Asia Board of Directors are also listed as "inventors" on US patents on Pacific marine organisms.

The confusing relationship between GeneSeas activities and those of academic research at UP-MSI and the University of Utah has prompted questions about the Philippine company. According to Ping Peria, the coordinator of a new regional program to investigate biopiracy managed by Manila-based South East Asian Regional Insitute for Community Eduction (SEARICE), "no clear distinction can be drawn between public and private research going on at the UP-MSI lab... we're concerned that public funds and facilities may be subsidizing very promising research that is ending up in private hands. "[15]

Look for more stories focusing on patenting marine life in upcoming editions of RAFI Communique.

PACIFIC PLUNDER: KAVA

Ceremonial Plant Targeted in Multiple Patents

Pharmaceutical companies have recently turned their attention - and patent lawyers - to kava (*Piper mythesticum*). French company L'Oreal - a global giant with US $10 billion a year in sales in the personal care market - has patented the use of kava to reduce hair loss and stimulate hair growth. L'Oreal has obtained or is seeking patents in the US, Canada, Japan, China, Germany, France, Italy, the UK, Spain, Hungary, and Poland. L'Oreal is 49% owned by Switzerland's Nestle (the world's largest food and drink company with US $44 billion in sales in 1996).

The remaining 51% is held by "France's richest woman" Liliane Bettencourt, whose personal fortune is estimated to be Ffr 40 billion.[16]

Phytomedicines and the Life Industry

The growing Northern popularity of kava and many other plant based "phytomedicines" (often marketed as "homeopathic" or "herbal" medicines in North America) has created huge economic stakes in the phytomedicinal market. In 1994 (the latest figures available), retail sales in Europe, Japan, and North America together exceeded US $10 billion. For example, in Germany alone, sales of *Ginkgo biloba* products reached US $280 million.[17]

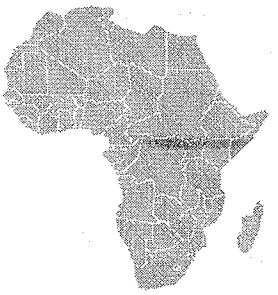
Pharmaceutical multinationals have rushed to get in on the act. Major players like American Home Products, Merck, Pfizer, Rhone Poulenc, SmithKline Beecham, Boehringer Ingelheim, and Monsanto are staking out claims in phytomedicine companies.[18]

Kava is a cultivar related to black pepper (*Piper nigra*) grown in many Pacific countries where it is an important cash crop and is highly valued as the source of the ceremonial beverage of the same name. Over 100 varieties of kava are grown in the Pacific, especially in Fiji and Vanuatu, where it is thought to have been first domesticated thousands of years ago. In North America and Europe, kava is now being aggresively promoted for a variety of uses - most often for its anti-stress tranquilizing effects. In Europe alone, kava extracts are being sold by at least 14 drug companies. According to the US phytomedicine company Natrol, kava is "a product that could move into the mainstream of consumption by today's baby-boom generation."[19]

The phytomedicine industry says that it is not patent-dependent; but it does pursue patents for many products - especially profitable big sellers like kava. Companies are quickly monopolizing specific uses for kava and methods for its processing and preparation as patents sprout up in the US, Europe, and Japan. The German phytomedicine company Willmar Schwabe GmbH (1400 employees, 1994 retail sales of DM 650 million)[20] has patented the use of kava to assist treating stroke, insomnia, Alzheimer's disease, and other applications. Another German company, Krewel-Werke GmbH, has patented its system for extracting medicinal compounds from kava for oral use.

By patenting methods of preparation, processing, and use of kava, the is concern that industry is wresting control of kava from small farmers and may eventually reduce them to cheap labour for companies making Western, kava-based pharmaceuticals. The considerable industrial interest in kava has also provoked concern in Pacific countries that companies may try to monocrop the plant elsewhere. Australian interests have sought kava germplasm from Samoa for the purposes of planting 10,000 ha of kava Down Under.[21] Other reports of kava plantation plans in Mexico and the US state of Hawaii have increased attention to access regulations in Pacific countries.

PATENTS ON AFRICAN SWEETENERS



Biotech Industry Sweet on Plant Proteins

Commercial development of sweet proteins derived from African plants could be worth millions if new, natural sweeteners can bite into the US $2 billion low-calorie sweetener market.[22] Research on intensely sweet proteins is not new, but recent breakthroughs may improve prospects for commercial development.

Most industry researchers admit that naturally sweet berries from the African plants mentioned below have

Sweet Protein	Native Plant Source	Relative Sweetness (sucrose=1)	US Patents	Company or University
Thaumatin	*Thaumatococcus danielli* (West Africa)	3,000	4,011,206 5,464,770	Tate & Lyle (UK) Xoma Corp. (US)
Monellin	*Dioscoreophyllum cumminisii* (West Africa)	3,000	3,998,798 others pending	University of Pennsylvania (US) Kirin Brewery (Japan)
Brazzein or Pentadin	*Pentadiplandra brazzeana* (Central Africa)	2,000	5,527,555, 5,346,998 5,326,580	U. Wisconsin (US)
Miraculin	*Richardela dulcifica* (West Africa)	n/a	?	BioResources Intl. (US/Ghana)

been used for centuries by local African communities to sweeten food and beverages. But patent claims by the biotech industry fail to recognize or reward these communities as a source of knowledge or innovation.

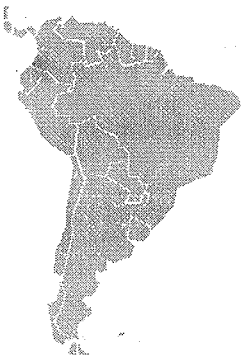
- Researchers at Kirin Brewery (Japan) report in the May, 1997 issue of *Nature Biotechnology* that they have successfully coaxed genetically engineered yeast cells to produce the sweet protein monellin at levels exceeding the yields of monellin from serendipity berries, the West African plant (*Dioscoreophyllum cumminisii*) from which the protein is naturally extracted.

- Thaumatin, a sweet protein derived from West Africa's *Thaumatococcus danielli*, is already marketed by Tate & Lyle (UK) under the brand name Talin. Xoma, a US biotech company, claims that it can produce the thaumatin protein using recombinant DNA technology at a cost that will compete with extraction from the natural plant source.

- Miraculin, derived from the "miracle fruits" of a West African plant, *Richardella dulcifica*, is a taste-altering protein that turns a sour taste to a sweet one. Researchers at BioResources International (US/Ghana) are cultivating miracle fruits and hope to purify the protein via genetic engineering.

BRAZIL BUSTS BIOPIRATES

Brazilian NGO Indicted Congress Investigates Biopiracy



The name, Selvaviva, means "Living Rainforest"; but indigenous people and a Brazilian public prosecutor say the NGO should be extinguished by the courts. The charge: biopiracy.

Working with the indigenous peoples' group União das Nações do Acre e Sul do Amazonas (UNI-AC), NGO Conselho Indigenista Missionário (CIMI), and an investigative report prepared by a regional congressional committee, State of Acre prosecutor Patrícia de Amorim Rêgo has filed a civil suit requesting an immediate suspension of Selvaviva's activities in Acre and, to follow, the banishment of the group from the highly diverse western region of Brazil.

Selvaviva was formed in 1988; but never properly fulfilled legal requirements for incorporation. It is headed by Ruediger von Reininghaus, a Austrian native and naturalized citizen of Brazil. Selvaviva says its primary mission is the improvement of health conditions in Acre indigenous communities. According to court documents, however, during von Reininghaus' periodic visits to indigenous peoples' communities in Acre since at least the late 1980s the NGO has done little more than collect indigenous peoples' medicinal plants and knowledge. Promises of health posts and medical training have gone unfulilled.[23]

Indigenous people report the only help they've received from Selvaviva is an occasional donation of medicines. These donations were solicited by von Reininghaus from pharmaceutical multinationals Novartis, Hoechst, Bayer, and, according to some reports, Johnson & Johnson and Eli Lilly. The connections between Selvaviva and industry have aroused strong suspicions in Acre and other parts of Brazil that Selvaviva is handing over the plants and knowledge it collects as part of its "medical aid" programs to multinational pharmaceutical companies.

Selvaviva's critics also point to curious inconsistencies in the NGO's promotional materials. While Portuguese versions de-emphasize bioprospecting activities, what is presented as a parallel translation in English contains different text which highlights bioprospecting services that Selvaviva might provide.

The case has received wide media attention in Brazil and Selvaviva's future does not look good. The civil suit is pending in Acre's courts, and the indigenous people with whom it was trying to work, including the Kaxinawá, Katukina, Yawanawá, Kampa (Ashaninka), and Kulina are supporting the NGO's expulsion from Acre. In addition, a legislative initiative led by State Deputy Edvaldo Magalhaes has resulted in a new state law to regulate access to biodiverity in Acre.

The Selvaviva case is one of many being examined by a Brazilian House of Representatives Committee looking into biopiracy in the Amazon. Officially known as the "External Committee to Investigate Charges of Illegal Exploitation and Trade of Plants and Genetic Resources from the Amazon Region", it is more often simply called the "House Committee on Biopiracy".

The Committee was formed in August of this year and is headed by Representative Socorro Gomes from the state of Para. Gomes is chairing public hearings on cases including the Foundation for Ethnobiology (see RAFI Communique Sept/Oct 1995). The Committee's report is expected late this year.

A Reminder to Readers

The latest information on the ongoing External Review of the Consultative Group on International Agricultural Research (CGIAR) can be found at RAFI's External Review website. Visit the site at the address below.

http://cgiar.rafi.org

NGO BIOPROSPECTING FOR INDUSTRY

Conservation International Cuts Deal to Gain Position in Bioprospecting Benefit Streams

According to the US-based environmental NGO Conservation International (CI), *"human progress and resourcefulness must be an integral part of conservation strategies"*; but the knowledge and people that interests CI is not that of the farmers and indigenous people.

This February, CI positioned itself as a potential prime beneficiary of benefit-sharing agreements in an ambitious plan to be a bioprospecting intermediary in up to 23 countries. CI has signed a sweeping Memorandum of Understanding with California-based Hyseq Inc., a publically-held company specializing in genome sequencing. CI's other partners in protecting diversity include McDonalds restaurants, *"whose customers,"* says the NGO, *"are buying a caring, socially responsible company along with their burger and fries."*[24]

In the arrangement, which CI and Hyseq call a "comprehensive bioprospecting program", CI has pledged to pre-screen drug candidates for Hyseq. In cooperation with national organizations and institutions, CI will:[25]

- engage *"CI's staff conservation biologists, ethnobotanists, communication and development specialists"* to *"conduct research regarding specific examples of fauna and flora through its in-country offices"* in 23 countries.

- work to *"compile information regarding the policies and regulations on licensing and access to biological resources and/or the responsible institutions, organizations or agencies... and present these findings as well as the information gathered* [on biological resources by its staff] *in a report to Hyseq."*

For its part of this screening stage of the agreement, Hyseq will:

- *"make an up-front contribution to CI, on a country basis."*

- *"pay CI an annual fee... to fund CI direct and indirect costs incurred in connection with the project"*

- *"evaluate* [CI's] *report and, assuming that such report supports the commercial viability of a bioprospecting venture, will formulate a specific approach to the sequencing of the genome of specific germplasms..."*

Hyseq has made an initial payment of US $20,000 to CI to produce reports.[26] According to Marianne Guerin McManus of CI's Washington headquarters, Hyseq's money has *"been sent to the field for reports on a number of potential products"* from *"four or five species"* but CI's confidentiality agreement with Hyseq prevents the disclosure of any details about the species and countries involved.[27] The agreement is just getting under way and both groups predict much more work together.

If Hyseq is interested in the flora and fauna profiled in CI's reports, then CI will "assist" the negotiation of a bioprospecting contract *"with respect to specifc specimens of flora and fauna in the source country."* Having thereby obtained access to interesting samples and subject to the terms of the bioprospecting agreement, Hyseq will then *"solely own the data, information, inventions and other results, including all material and intellectual property rights."*

When a product is commercialized, CI has made provisions in the memorandum to ensure that it will directly receive a share of the profits and will also have a hand administering a conservation fund to be set up in the country of origin.

The agreement makes no specific reference to indigenous knowledge, but does note that CI will use ethnobotanists in its efforts to identify plants on Hyseq's behalf and that the company will be free to pursue intellectual property claims on any results of the agreement. Tested on the question, CI says that use of indigenous knowledge is *"possible; but not at this stage"*, rendering the CI ethnobotanists role in the agreement unclear.

Despite being a non-profit, CI is no stranger to commercial bioprospecting and brings experience to the deal. CI has been bioprospecting in Surinam for at least three years, where it is a partner with SmithKline Beecham in the US government-funded ICBG project. CI and NIH, however, both say the two programs are entirely separate.

Where *MIGHT* CI and Hyseq be Prospecting?

Because of a confidentiality agreement, neither Hyseq or CI will say where they are working now; but they confirm that their deal potentially covers every country in which CI works. So CI's in-country staff in any (or even all) of the countries below might take time out from their environmental work to prepare and send reports to the pharmaceutical company.

Belize	**Bolivia**
Botswana	**Brazil**
Colombia	**Costa Rica**
Ecuador	**Fiji**
Ghana	**Guatemala**
Guyana	**Indonesia**
Japan	**Madagascar**
Mexico	**New Caledonia** (France)
Panama	**Papua New Guinea**
Peru	**Philippines**
Solomon Islands	**Surinam**

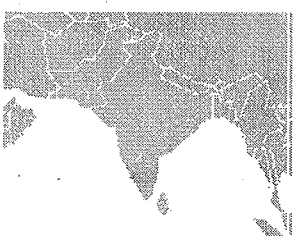
United States

CI characterizes its role in the agreement as "technical assistance" and says the arrangements it has made with Hyseq are praiseworthy because the access portion of the bioprospecting scheme *"is more complicated than going to a botanical garden"* and more ethical than going to the numerous *"small local outfits shipping thousands and thousands of samples a year"* that Guerin McManus says CI has identified in most of the countries where CI has offices.

Hyseq is proud of the agreement, which provides the company cheap scientific expertise and help facilitating access in up to 23 countries, including many of the world's most biodiverse places. In a press release, Hyseq's CEO Louis Gruber joins CI in a round of tired rhetorical claims that the best way to save biodiversity is to privatize it. Evoking years of failed or, at best, marginally successful rainforest marketing projects, Gruber says *"By applying our technology to the diversity of the natural experiment going on all around us, we believe that commercially viable ways to maintain the rain forests can be found. This is very important to our business as well."*

Governments, farmers, and indigenous peoples involved with or who are approached by CI in convervation work might well wonder if the NGO will be doing bioprospecting - on the side - in their country or communities. And, if so, people in countries where CI operates should keep a careful eye on any benefit sharing sharing agreements in which CI is involved to ensure that they do not direct benefits in ways that would be better and more appropriately entrusted to local communities. The best option, however, given the bilateral, community-unfriendly structure of the bioprospecting agreements envisioned by Hyseq - CI memorandum, would be to not participate in them at all.

INDIAN VICTORY



Turmeric Patent Overturned; but "Inventors" Fight to Retain Claim

In August the Indian Government's Council of Scientific and Industrial Research announced that its challenge to the a University of Mississippi (US) patent on turmeric (*Curcuma longa*) had succeeded. Mississippi had sought monopoly control in the US over the use of turmeric (also called haldi), an ingredient in Ayurvedic medicine since antiquity, to promote wound healing (see *RAFI Communique* December 1996).

In proceedings at the US Patent and Trademark Office (USPTO), the Indian Government argued the obvious to the "experts" in the US government: Indians had been using turmeric for the same uses claimed in the "new" "invention" for thousands of years. The USPTO admitted that India was correct and rejected Mississippi's claims.

But the case isn't over. According to Dr. Hari Har Cohly, one of the patent's "inventors," he and his co-inventor Dr. Suman Das have submitted a narrower version of their turmeric claim in an attempt to hold on to at least part of the patent. The USPTO has yet to rule on this reworked version.[28]

Future editions of RAFI Communique will provide updates on the turmeric patent.

COMMUNIQUE UPDATES

Scientific Review Rejects the HGDP

Opponents Vindicated

A long-awaited US National Research Council (NRC) report released October 21 has unambiguously rebuffed the controversy-plagued Human Genome Diversity Project (HGDP), a project that proposed to collect DNA samples from over 700 groups of people - mostly indigenous communities - from around the world. According to the prominent NRC committee of ethicists, scientists, and lawyers, a global survey of human genetic diversity is merited; but the HGDP proposal is both ethically and scientifically inadequate. According to the NRC committee: *"Following an exhaustive examination, the committee found the* [HGDP] *proposal does not clearly explain the purpose of the project or provide the necessary safeguards for protecting participants."*

"We welcome the official rejection of the HGDP," says Jannie Lasimbang of Sabah, Malaysia and President of the Asian Indigenous Peoples' Pact, *"especially considering HGDP never seriously consulted and worked with the subjects of the proposed project and never fully addressed concerns raised by dozens of indigenous peoples' organizations across the world."* Many of the NRC's most important findings echo positions indigenous people, RAFI, and other NGOs have maintained for years but which were dismissed by the HGDP.

Since 1993, RAFI has publicly maintained the HGDP is ethically flawed and has displayed *"fundamental failures in comprehending the socio-political environment in which the Project must perform."* As recently as April, 1997 RAFI wrote to scientists associated with the HGDP urging that the HGDP disband in light of its consistent failure to respond adequately to the concerns of indigenous peoples, and because the HGDP was impeding dialogue on the broader goal of protecting human diversity. The NRC concurred; it found the HGDP's proposal so lacking that the project was disregarded in favor of taking a fresh look at the merit of research on human genetic differences.

The NRC report could clear the way to begin serious dialogue about ethically sound possibilities of protecting human genetic diversity which avoid the HGDP's

numerous failures. Its findings have important implications for the development of any future protocol - nationally or internationally - on the collection of human DNA. It concludes that, *"It is not ethically or legally acceptable to ask research participants to "consent" to future but yet-unknown uses of their identifiable DNA samples. Consent in such a case is a waiver of rights, and such waivers are explicitly prohibited by federal research regulations."*

Indigenous people say the design and implementation of a survey of human genetic diversity must include their full participation. According to Leonor Zalabata Torres, an Arhuaco indigenous person from Colombia who testified before the NRC Committee in September, 1996, full participation *"means indigenous peoples' control over samples after collection and full protection from patent claims on our tissues."* RAFI also urges that military access to human DNA samples be prohibited under any circumstances. In the past year the World Medical Association has expressed concern about the potential development of genetically-targeted weapons and the US Department of Defense has begun to discuss population-targeted biotech weapons in future combat scenarios.

The NRC recommends that if a diversity study goes forward it should be intergovernmentally controlled and that the US Government *"should initiate discussions with the international agencies that may govern a global survey."* Since 1993 RAFI has consistently maintained that if any global study of human diversity was to be undertaken, it must be conducted under the umbrella of an intergovernmental organization and with the full informed consent and participation of indigenous people. The HGDP consistently refused to submit itself to UN supervision.

The NRC report isn't all good news. After clearly pointing out the need for a complete research protocol, it recommends that money should be spent on a non-HGDP diversity study for "projects originating in the US." A green light for a diversity study anywhere is premature and wholly inconsistent with the NRC's call for a complete research protocol requiring both UN supervision and research subjects' approval to be in place *before* consent procedures, much less collection, can start. Will the US government, which has patented indigenous peoples' cells, use an ambiguous description of the study's geographic scope to bypass the NRC conclusions about UN supervision and Human Rights and collect globally?

The NRC also recognizes and draws attention to the problems that patents cause for research on human genetic diversity. Echoing years of statements by indigenous people and NGOs, the NRC concludes *"much or most of the international controversy over collecting genes to study human genetic variation would disappear if the patenting of genes and gene sequences were outlawed."* But despite this statement and the fact that many indigenous peoples' organizations refuse to participate in a diversity survey that does not unconditionally reject patenting, the NRC falls short of recommending a patent prohibition.

The NRC's conclusions on ethics and Human Rights confirm that it is premature for the collection of human DNA to go forward. According to Alejandro Argumedo of the Indigenous Peoples' Biodiversity Network (IPBN) *"First we need to see if a project that meets the approval of research subjects can be designed. Then - and only then - can a discussion of funding collections start."*

In the meantime, indigenous peoples organizations worldwide have called for a global moratorium on the collection of human DNA samples. RAFI supports the moratorium.

The NRC report, "Evaluating Human Genetic Diversity" is available from the National Academy Press, 2101 Constitution Ave., NW, Box 285, Washington, DC 20055. For more information: http://www.nap.edu

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[1] According to CBD figures as of 1 June 1997.

[2] The ICBG-Peru royalty rates have reportedly changed, however, Peru's Sociedad Peruana de Derecho Ambiental and others involved in the negotiations have refused to release the new royalty rates and contract(s). These and other ICBG materials are currently the subject of a RAFI Freedom of Information Request to the US government.

[3] Royalty rate reported on National Public Radio's (US) All Things Considered, 5 September 1997. Audio available on the internet at www.realaudio.com/contentp/npr/nc7s05.html. The National Park Service confirmed NPR's figure as the high-end royalty to be paid on a sliding scale. Park Service officials declined to further elaborate on the agreement's royalty structure.

[4] See, for example, Tranberg, Pernille, "Unique biodiversity program in Costa Rica" in *Earth Times*, 25 February 1996.

[5] Telephone interview with John Varley, Director, Yellowstone National Park Center for Resources, 11 September 1997.

[6] While its properties were not discovered at Yellowstone, the microbe *Thermius acquaticus*, whose genes are crucial to polymerase chain reaction (PCR) was discovered in Yellowstone's hot springs.

[7] Quotes from Edmonds Insitute's press release "Yellowstone 125th Birthday Celebration Tainted," 15 August 1997. Contact beb@igc.apc.org for more information on this suit.

[8] *Biotech Reporter*, October 1997, pg. 5.

[9] Canine, Craig. "Pain, Profit, and Sweet Releif" in *Worth*, March 1997: http://www.worth.com/articles/Z9703F01a.html

[10] INPADOC database.

[11] From Warner-Lambert's "investor relations" pages on the internet at: http://warner-lambert.com/info/irelations.html

[12] "Medtronic Earnings Rise 23.7 Percent In Fiscal 1997 On Strength Of Pacing And Neurological Businesses",

Medtronic press release dated May 22, 1997. (See http://www.medtronic.com/news/fy974q.html)
[13] Neurex SEC 10-K filing, 31 March 1997.
[14] See the GeneSeas home page at: http://www.compass.com.ph/~giselapc/webpage.html
[15] Personal communication, Novermber 1997.
[16] "Nestle to Remain True to L'Oreal" in *Le Monde*, 11 May 1997, p. 14.
[17] Grünwald, Jörg. "The European Phytomedicines Market: Figures, Trends, Analyses". Grünwald is the Director of the Medical-Scientific Department of Lichtwer Pharma GmbH, Berlin, Germany.
[18] Grünwald, Jörg. "The European Phytomedicines Market: Figures, Trends, Analyses".
[19] Natrol Corp. "Kava White Paper", http://www.natrol.com/wp_kava.html
[20] Hoppenstedt Directory of German Companies.
[21] Personal communication, William Cable, Samoan Ministry of Agriculture, September, 1997.
[22] Information in this article is gleaned, in part, from: Robert Dansby, "Sweet Science: Overexpression of Monellin in Yeast," *Nature Biotechnology*, Vol. 15, May, 1997, pp. 419-420.
[23] *Ação Civil Pública Cautelarcom pedido de liminar contra Selvaviva,"* submitted in Rio Branco, Acre (Brazil), 29 July 1997.
[24]http://www.conservation.org/web/HOW2HELP/CORP/Mcdonald.htm
[25] Quotes from "Memorandum of Understanding Between Conservation International Foundation and Hyseq Inc."
[26] Hyseq reports this amount to be US $30,000 in its filings with the US Security and Exchange Commission; but CI says the amount transferred is the lower figure above.
[27] Telephone interview, September 1997.
[28] Telephone interview with Dr.Cohly, November 1997.

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