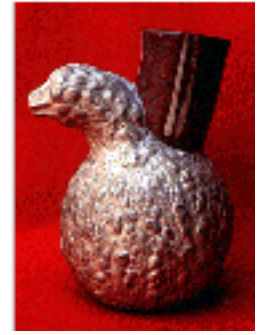




Ethnobotanical Leaflets



Ethnobotanical Crisis as the US Government Attempts to Utilize Biowarfare to Unwisely Combat the War on Drugs

By Scott Herron

The United States government has granted the US Department of Agriculture \$23 million to develop pathogenic fungi to be used as biological control agents to eradicate the narcotic drug market of coca, opium poppy, and marijuana. The attempt to win the war on drugs with countries like Colombia in South America is noble, but America's current tactics are downright dangerous and counterproductive.

A strain of the fungus *Fusarium oxysporum* known as EN4 is potent killer of the plants processed into cocaine, *Erythroxylum coca* var. *coca* and *Erythroxylum novogranatense* var. *novogranatense*. The danger with the method of releasing large quantities of this *Fusarium* fungus strain into the regions like the Upper Putumayo River region of the Amazon basin, is that *Fusarium oxysporum* EN4 (f. sp. *erythroxili* forma *specialis* Nova) is not host specific. This means that the fungus can attack plants other than the intended host of coca. This is dangerous because 4 other species of the *Erythroxylum* genus are endangered plants in Colombia, and these non-cocaine producing plants would be killed during this war on drugs.

Additionally, most of the residents of Peru and Boliva chew coca leaves like Americans drink coffee, to reduce elevation sickness and curb hunger pains in the Andes Mountain range. This legal activity would be affected by the biowarfare proposed by the US, because the *Fusarium* fungus rapidly expands its range, while staying present in the soil for years after it has killed its intended targets (coca plants of Colombian drug lords). The economies of Peru and Boliva could be devastated by the US's actions, and if the strains of the fungus reach the legal coca fields, the innocent coca leaf chewers could be severely injured by the mycotoxins like Sambutoxin.

Many domestic crops and other plants in the regions of intended use are suseptable to the non-host specific strain of fungi. The legal coca growers for the pharmaceutical industries of the world (including America) could have their crops destroyed by this fungus which is very difficult to detect in the soil or on plants, due to its size and morphology, without the costly aid of Mycological specialists and microscopic equipment.

There are numerous other issues covered in the articles of the Press Release from May 2, 2000 and the website of the [Sunshine Project](#). Please contact your local congressional representatives, the USDA, and EPA to voice your concern for this US funded project. Other solutions need to be found and used to combat the war on drugs, this is not a viable solution, it will cause more damage than one can imagine on a global scale.

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Press Release

The Sunshine Project 2 May 2000

Report Calls on the UN Biodiversity Convention to Stop Dangerous US Fungus Experiments (Hamburg & Seattle, 2 May 00)

In a detailed report released today, the Sunshine Project, a new international non-profit dedicated to exposing abuses of biotechnology, calls on the upcoming Nairobi meeting of the UN Biodiversity Convention to halt the USA's dangerous experiments with fungi designed to kill narcotic crops.

TARGETED AT DEVELOPING COUNTRIES OF ASIA AND THE AMERICAS

Intended to kill opium poppy, coca, and cannabis plants, the microbes present risks to human health and biodiversity. There is imminent danger that a highly infectious fungus will be deliberately released in Andean and Amazonian centres of diversity. The US-backed fungi have already been used experimentally on opium poppy and cannabis in the US and in Central Asia.

Fungus targets include hundreds of thousands of cultivated hectares in narcotic crop-producing countries in South, Southeast, and Central Asia, along with Mexico, Central, and South American countries. Thirty years after the heavy use of toxic herbicides (Agent Orange) in the Vietnam War, the USA is planning the use of a biological agent ("Agent Green") in the Drug War.

ENVIRONMENTALLY UNSOUND - THREAT TO ENDANGERED SPECIES

The strains of the fungi *Fusarium oxysporum* and *Pleospora papveracae* might infect and kill plants other than coca, poppy, and cannabis in ecologically sensitive areas of Asia and the Americas.

US Department of Agriculture researchers have never tested the host range of Agent Green on plant species native to target countries, including Colombia, which is currently number one on the USA's list of places to use the fungi. Only a limited range of commercial crops were tested, which is little indication of how the fungi will behave in the varied and poorly-understood real-world ecologies where they might be used.

"The USA is playing roulette with irreplaceable biological diversity" says Susana Pimiento Chamorro, a Colombian lawyer with the Sunshine Project. "In Colombia, four close relatives of coca are already listed as endangered. Agent Green might be the last step to their extinction."

It is well known that some strains of *F. oxysporum* can infect many different plants, even distantly related species. To avoid disturbing delicate ecosystems in the Amazon, rural Southeast Asia, and the Andes, the fungi must not be released.

One of the most highly prized butterflies in the world, the Agrias (*Agrias* sp.) depends on coca's wild relatives in Amazonian rainforest. Plants in the coca genus are the butterfly's host plant, the only place where young larvae feed and mature. A beautiful fast flyer listed as endangered in Brazil, one of Agrias' centres of speciation is the Upper Putumayo River region, precisely where the US intends to apply the heaviest doses of the coca-killing fungus. If the fungus attacks wild coca relatives, it will ultimately hurt the Agrias butterfly.

Even more disturbing is the fact that strains of *Fusarium oxysporum* are highly toxic to animals and humans. Birds feeding on plant seeds are endangered, and consumption of the coca leaves - which is legal in Peru and Bolivia - might pose a health threat. "*Fusaria* can produce mycotoxins that are deadly enough to be considered weapons of war and are listed as biological agents in the draft Protocol to the Biological and Toxic Weapons Convention," says Sunshine Project biologist Dr. Jan Van Aken, "US researchers have not tested Agent Green's production of these deadly mycotoxins."

Once released into the environment, the deadly fungus cannot be recalled. Indeed, the coca fungus appears to have escaped scientists' grasp when it jumped into control plots during field tests in Hawaii.

REJECTED IN THE USA BUT PROMOTED ABROAD

The fungus has been clearly rejected in the USA, the world's number one producer of illicit cannabis. Last year, the Florida Environmental Protection Agency emphatically opposed and halted a proposal to use *Fusaria*. According to the Agency's director: "It is difficult, if not impossible to control the spread of *Fusarium* species. The mutated fungi can cause disease in large number of crops *Fusarium* species are

more active in warm soils and can stay resident in the soil for years."

Senior US officials have failed to obtain the financial backing of other governments for the plan. Except for modest support from the UK for the poppy killer, no other donor country has financially backed the idea. But this has not stopped the USA's drug warriors from pressuring Asian and South American countries. Through the offices of the UN Drug Control Programme (UNDCP), pressure is being put on Colombia especially, which is being asked to sign a field testing contract. Ironically, it was under Colombian leadership that the recent Biosafety Protocol negotiations were successfully concluded, and Colombia's Environment Minister is now President of the high-level UN Commission on Sustainable Development.

FUNGUS MOVEMENT CAN LEAD TO INNOCENT VICTIMS

According to the Sunshine Project's Edward Hammond, "An obvious and flagrant flaw in the fungal eradication plan is that microbes pay no attention to passport and visa requirements. The fungus can spread without regard to political borders, potentially attacking legal crops and countries that do not agree to its use."

There are many potential victims. Canadian industrial hemp growers have expressed concern about US plans. Fungus applications in coca growing areas in southern Colombia, for example, might lead to infections in Ecuador, Brazil, or Peru (a legal coca producer). Use in Central and South Asia, for example Afghanistan, Pakistan, or Turkmenistan, could lead to losses for bordering India which, under a strict licensing system, produces about half the world's legal pharmaceutical opiates. In Southeast Asia, a variety of disastrous scenarios can be envisioned, where opium poppy areas for example in Burma border on Laos, Thailand and China, which produces opiates for domestic pharmaceutical use.

If developing country production of legal pharmaceutical opiates is damaged by fungus spread, industrialized producers like Australia - which has already planted extra-potent genetically engineered opium poppy - could increase market share.

THREATENS TRADITIONAL USE

The rights of indigenous people who cultivate the target crops for traditional, non-drug uses are also endangered. In South Asia, poppies are used in traditional medicine and plant material is used as fodder. Coca has been used for over a millennium in traditional medicine from Colombia to Argentina. Under the Biodiversity Convention indigenous peoples are afforded rights to their biodiversity - including medicinal plants. Indigenous people who live close to where fungus is applied may become innocent Drug War victims.

GENETIC ENGINEERING POSSIBLE

The United States says that the fungus varieties it wants to use in developing countries are not

genetically-engineered. But it has created genetically-modified strains in the laboratory. US scientists have also cloned virulent genes from related fungi (Fusarium strains that attack potatoes) with the possible intent of increasing the kill rate of anti-drug fungi through biotechnology. A consequence of permitting testing and use of the current fungi will be future pressure for countries to allow "enhanced" Living modified organisms (LMOs) fungi.

ACTION BY THE BIODIVERSITY CONVENTION IS URGENTLY NEEDED

Governments have a legitimate need to control narcotic crops; but doing so through the use of "Agent Green" microbes is profoundly misguided and sets an alarming precedent. If governments are idle while microbial agents are developed to attack narcotic crops, how will they protect biodiversity if microbes are developed to kill other unpopular and regulated crops, like tobacco, kava, betel nut palm, peyote, ayahuasca, or hops?

The Sunshine Project, which sent its report to 500 government delegates from 100 countries, is suggesting several options for government action during the May 15-26 Conference of the Parties to the UN Convention on Biological Diversity (CBD) in Nairobi. Delegates should adopt a resolution calling for a halt of the US program and condemning the use of any microbe for the purpose of eradicating cultivated crops. Such a resolution is not a statement on drug policy; but instead a reiteration of fundamental objectives of the Convention. The CBD cannot remain quiet while agents are developed by a non-party to deliberately obliterate biodiversity, especially plants with legitimate medicinal and traditional uses.

The CBD may also consider studying the fungus under its Agriculture Program, because of the fungus's impacts on pollinators and soil diversity - both specific responsibilities of the Convention. Governments may also request the CBD Executive Secretary to urgently convey the CBD's views to the United Nations Drug Control Programme (UNDCP), which has been - sometimes reluctantly - helping implementation of the US program.

About the Sunshine Project

The Sunshine Project is an international non-profit organization dedicated to bringing information to light on harmful abuses of biotechnology. The Project has expert staff with training in law, policy, and biology with lengthy experience on policy issues. The Project has offices in Hamburg, Germany and Seattle, USA. For more information, visit our [website](#) or contact us by telephone or e-mail.

A copy of the Sunshine Project's report on Agent Green is available at our website or on request (tsp@sunshine-project.de).

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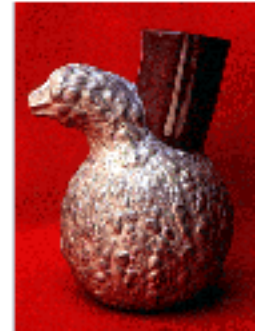
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Tang Center for Herbal Medicine Research and Tang Professorship established at the University of Chicago

By Miriam Kritzer Van Zant

University of Chicago (UC) Hospitals has always stood for one thing, excellence in medicine. That medicine has tended to be conservative in the extreme, a cautious hedge against scientifically untested wishful thinking including that of the popular new age kind. It still is. But something new has been added to the roster. Shutsung Liao, PhD, a long time researcher in the Ben May Institute for Cancer Research, and professor in Biochemistry & Molecular Biology, is first to hold the Tang Professorship in Herbal Medicine. He will also be the first Director of the Tang Center for Herbal Medicine Research.

The purpose of the Center will be to verify the effects of traditional eastern herbs, many of which are now becoming popular in the United States. In an article in *Legacy*, Winter 1,999-2,000, a newsletter for UC hospitals, it is stated that one out of three Americans use herbal products of some kind but not even one out of 3,000 scientific studies address non-traditional therapies.

Liao is an expert on androgens, male hormones. He is particularly interested in agents to block the effects of testosterone on the prostate gland. As a result he has studied epigallocatechins or EGCGs from green tea. EGCGs, induced significant shrinkage when injected into both human prostate and breast tumors that had been implanted into rats. He is interested in ginseng and has isolated several active ginsenosides from American ginseng. In the *Legacy* article, Dr. Liao said, researchers in the Tang Center will not simply target specific herbs or diseases. Instead, we will see where our basic research on different aspects of herbal medicine leads us. Chun-Su Yuan, MD, PhD and Assistant Professor in Anesthesiology & Critical Care has also been appointed to the Tang Center.

Funding for the Center and the Professorship, has come in the form of a \$5 million gift from the Tang Family Foundation and the Tang Foundation for the Research of Traditional Chinese Medicine. Both foundations were founded by businessman Cyrus Tang, whose company Tang Industries, Inc includes industrial, pharmaceutical, furniture and real estate holdings. He is also on the board of directors for AK Steel, a major U.S. steel producer.

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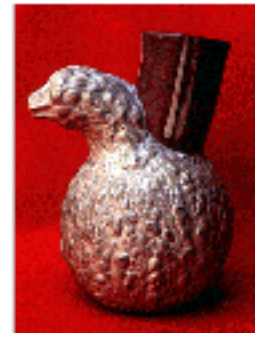
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Post-Hurricane Watershed Restoration in Acachapa, El Salvador

**By Nadia Navarrete-Tindall, University of Missouri-Columbia and
Georgeann Hartzog, Peace Coalition, Alto Pass, Illinois**

Acachapa is a community of approximately 80 families located in the Southwestern part of El Salvador. Tapping balsamo trees for resin is an important source of income in Acachapa. Farming, raising chickens, and aquaculture of fresh water shrimp, crabs and fish, in the Acachapa River, also sustain the community.

Nadia Navarrete-Tindall, a native of El Salvador, first approached the balsam tappers (balsameros) of Acachapa in March of 1998 with a proposal for a project sponsored by New Mexico State University. Project objectives are to increase community income, preserve a sustainable resource and act as a model for neighboring communities where balsam trees have been suffering from deforestation and replacement by other crops. Community income of Acachapa residents was to be increased by teaching how to produce and market natural products from the balsam tree.

Hurricane Mitch hit Central America in October 1998. Ensuing rains caused major flooding in the region. Rains washed out crops and severely damaged the watershed around the river near Acachapa. When Navarrete-Tindall and colleagues met in El Salvador with a group of the balsam tappers, the community's plea was for help reforesting their watershed. The balsameros also want to prevent further damage to their cropland and to river based production. They urgently need help to begin replanting fast-growing trees, and to set up nurseries for future reforestation. An Environmental Committee formed by Acachapa residents, hopes to begin restoration of their watershed by establishing riparian buffer strips along the Acachapa river.

Navarrete-Tindall has sought donations in the U.S. for funds to obtain and transport seedlings and to support community members as they begin the labor of replanting.

The Peace Coalition, Sierra Club, John A. Logan College and other southern Illinois organizations sponsored fund-raising talks. Logan students also organized a plant sale. The Peace Coalition and the Environmental Committee of Acachapa continue to ask for donations from individuals and organizations to help the reforestation project.

In order to protect the land from further erosion it is necessary to finish preparation of the tree nursery. It will be necessary to plant 15,000 trees combined with native shrubs and herbaceous species in the proposed buffer strips.

Individual contributions totaling \$950 began the project. Navarrete-Tindall was awarded a \$5,400 grant by the National Agroforestry Center in Nebraska to cover part of the expenses to establish a nursery and buffer strips along the river this year (2000). A \$3 donation will cover cost, transportation, and maintenance of one tree for a year.

For more information please contact Hartzog (ghartz@midwest.net) in Illinois or Navarrete-Tindall (navarreten@missouri.edu) in Missouri. Donations can be sent to the Peace Coalition of SI, 1702 Taylor Dr., Carbondale, IL 62901 with a notation to Hurricane Relief.

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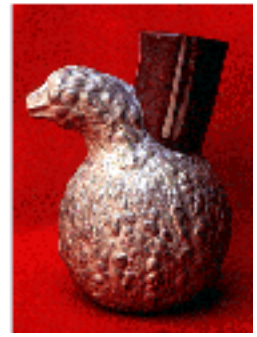
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Editorship of *Economic Botany* Changes Hands



Don Ugent (left), newly appointed editor for the *Journal of Economic Botany*, met with retiring editor Lawrence Kaplan at his Boston home on July 25, 1999. Ugent will be responsible for bringing out the first issue of *Economic Botany* for the year 2000.

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