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15 February 2007

tea for the poor

“traditional herbal tea to tackle malaria for poor communities who cannot access or afford to pay for anti-malarial products developed by the pharmaceutical industry.”

Synthesizing artemisia in the lab produces yields lower than four per cent, so the plant is the only commercial source of the compound.



A study, published in the Journal of Agricultural and Food Chemistry this week (13 February), found that growing Artemisia Annua (**Chinese Wormwood**) fertilizer-poor "acidic soils with a mild potassium deficiency" * increased the yield of artemisia by 20 per cent.

Synthesizing artemisia in the lab produces yields lower than four per cent, so the plant is the only commercial source of the compound.

This could lead to cheaper drugs, as well as benefiting small-scale farmers who have no choice but to grow their crops in poor soils.

The economic gains are clear for farmers who could make "savings in potassium, gains in artemisia production", said the study's author, Jorge Ferreira of the US-based Appalachian Farming Systems Research Center. Pedro Melillo, a horticulturalist from the State University of Campinas, Sao Paulo, Brazil, welcomed the news saying potassium is one of the most expensive fertilizers in Brazil.

He told SciDev.Net that the cultivation method could help develop a strategy for using Artemisia Annua as a traditional herbal tea to tackle malaria for poor communities who cannot access or afford to pay for anti-malarial products developed by the pharmaceutical industry.

Reference

<http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3417&language=1>

* prospects for growing Wormwood in Kenya are excellent

**Medical Conference
Nairobi, Kenya
June 2007**

Artemisia Known to Kill Malaria Parasite

Scientific Publication 2004

<http://www.newscientist.com/article.ns?id=dn4079>

A hitherto unknown but vital weakness in the malaria parasite has been exposed by studying extracts from ancient Chinese anti-fever remedies. The discovery opens a new front in the fight against the parasite, which has become resistant in most parts of the world to the most common anti-malarial drug, chloroquine.

Derived from the Chinese herb qinghao, or *sweet wormwood* (*Artemisia annua*), the extracts have already saved millions of patients in south-east Asia who would otherwise have suffered or died when conventional drugs failed.

Now researchers have discovered how the drugs, called artemisinins, actually work, revealing a chink in the *Plasmodium falciparum* parasite's armour. The chink is one of the two enzymes that enable the parasite to pump the correct amount of calcium into its cell membranes.

"Artemisinin hits one of those pumps directly," says Sanjeev Krishna of St George's Hospital Medical School in London, UK, the head of the research team. Once the calcium pump is disabled, the parasite dies within hours, although Krishna does not yet know the precise mechanism.

The discovery of the enzyme, called *Plasmodium falciparum* ATP6, or PfATP6, provides a juicy new target for drug makers and for researchers like Krishna who want to improve the killing power of artemisinins.

What is more, the gene that encodes the pump can now be monitored in parasites worldwide to see if it mutates to make the parasite resistant to artemisinins. "We could look for and anticipate resistance, instead of responding when it happens," says Krishna.

The discovery that artemisinins hit the enzyme came as a surprise, because the assumption till now has been that the extracts damage chambers where the parasite digests blood meals.

To prove the enzyme was the key, Krishna's team isolated it by injecting the messenger RNA that codes for PfATP6 into eggs of the frog *Xenopus laevis*. By comparing the effects of artemisinins with a chemical known to block the enzyme's action, as well as with drugs such as chloroquine, they were able to show that artemisinins block PfATP6 both in the eggs and in intact malarial parasites.

Manufactured in China and Vietnam, artemisinins are already having a huge impact in areas of south-east Asia where resistance to other drugs is rife.

Krishna says that the drugs are now beginning to prove their worth in Africa too, and combinations of artemisinin with other drugs are proving most effective. Together with Peter Kremsner of the University of Tübingen in Germany, Krishna's team is testing a combination with amodiaquine on children in Gabon.

Robert Ridley, coordinator of product development for tropical diseases at the World Health Organization in Geneva, says that the discovery should allow new artemisinins to be developed that work in three to four days, rather than the week that current formulations take. This would make it easier to patients to stick to a drug regime, he says.

And the discovery of the vulnerable enzyme should encourage the search for new drugs, which are desperately needed as resistance to older drugs escalates (see graphic).

“Chinese herb reveals vital malaria weakness”

18:00 20 August 2003

NewScientist.com news service

Andy Coghlan

Journal reference: Nature (vol 424, p 957)

Healing Malaria Conference

Nairobi, Kenya

June 2007

Chinese Shrub: Best Hope

January 2007

If it wasn't for the fresh, sharp scent, you could easily mistake [Sweet Wormwood](#) for any other kind of shrub. But this shrub, also called the *Artemisia annua*, is widely regarded by medical experts as the best cure for malaria, one of the world's leading killer diseases.

HOPE FOR CURE

There has been no let-up in the search for an efficacious anti-malaria drug with minimal side effects. The disease kills more than 1 million people each year, or one person every 30 seconds, and makes 300-500 million ill. Ninety percent of the deaths occur in sub-Saharan Africa.

The WHO describes malaria and HIV/AIDS as two of the most devastating health problems of our time, accounting for 4 million deaths a year. Africa, many parts of Asia and South America have long been hotbeds for the malaria parasite, but it's not just a problem for poorer nations. Even the most developed nations, which deploy troops in far-flung, often mosquito-infested territories, have also been searching for the best cure.

Compounding the urgency is the lack of a vaccine against the malaria parasite, which has grown resistant to well-known anti-malarials, such as chloroquine and pyrimethamine.

Quinine, extracted from the bark of the South American cinchona tree and in use for more than 160 years, was regarded as the drug of choice up to the early 2000s, until it was displaced by artemisinin in the controversial SEAQUAMAT (Southeast Asia Quinine Artesunate Malarial Trial) of June 2003-May 2005.

DEVELOPMENT

It was here in Luofushan in China's southern Guangdong province that the shrub with fern-like leaves first found its way into Chinese medical annals more than 1,600 years ago. No one knows how the Chinese discovered the shrub's life-saving properties, but it was doctor Ge Hong (283-363 AD) who first wrote about it in his *Book of Emergency Medicine* when he served as a Taoist priest in this mountainous region.

"Taoist priests were obsessed with the idea of elixirs. Ge Hong never found any elixir, but he discovered many herbal drugs, and he was the first to record the properties of artemisinin," said Zhang Shaoping of Guangdong New South Group Co. Ltd., which produces artemisinin-based combination therapies (ACTs).

Artemisinin is the malaria-fighting compound extracted from the shrub and is used to treat the disease, which causes fever, vomiting, body aches, diarrhoea, anaemia, loss of concentration, delirium, convulsions, coma and eventually, death. Children and pregnant women deteriorate especially rapidly because of their weak immune systems, and the very young can die within 24 hours of the onset of symptoms if they are not treated.

In this largest ever real-life trial for severe malaria, doctors in India, Bangladesh, Indonesia and Myanmar split 2,000 patients suffering from severe malaria into two groups, giving half of them artemisinin and the other half quinine. Speaking about the trial at an anti-malaria conference in China's southern Guangzhou city recently (week beginning Jan 15), Arjen Dondorp, of the Mahidol University in Thailand, said: "We had to stop the trial because of the huge difference in mortality in the two groups."

Artemisinin is the treatment of choice for severe malaria," he said.

The World Health Organisation recommends that artemisinin be used in combination with other drugs, or artemisinin-based combination therapies (ACTs), to slow the development of any resistance. (This is a deception! All evidence is to the contrary. Greed motives politicians as well as medical officials and professionals to promote patent medicines.)

Information taken from article:
Tan Ee Lyn / 25 Jan 2007
Reuters Foundation Alert Net

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Medical Conference
Nairobi, Kenya
June 2006

Ethiopia and Wormwood

It's about the money!

December 2004

"Artemisia, which grows wild in China and Vietnam, is considered one of the most effective treatments against malaria in the world."

"Experiments began in China in the 1970s but Mao's government kept it secret for decades"

"Research shows that artemisia (raw herb grown in China) remedies cure 90 per cent of patients in three days"

Artemisia annua, or sweet wormwood, has become his main source of income, and a life-saver for his community. Artemisia is an ancient cure for malaria, and the Chinese have long known about its medicinal properties. Now farmers in Ethiopia are discovering its virtues.

Tibebu Orcho holds up a packet of seven plastic bags, each filled with a finely ground, dark green leaf, and asks us to inhale its head-clearing scent. Mr Orcho grows artemisia in his idyllic garden, alongside apple trees and rows of cabbages. Once the plant is ready to be harvested, he cuts off the leaves, dries them and crumbles them up. He then fills plastic bags, seals them with a candle and sells them to neighbors to be made into tea...people from the community project (run by Send a Cow) told me I could grow it myself. I was hesitant at first, but I tried and it worked.

"Before, if people couldn't get any medicines when they shivered from malaria, they would just sit in front of the fire and try to keep warm. I am happy I am able to help them now."

Mr Orcho is at the forefront of a new stage of the ongoing battle against the disease. Artemisia, which grows wild in China and Vietnam, is considered one of the most effective treatments against malaria in the world.

Experiments began in China in the 1970s but Mao's government kept it secret for decades. Only recently has the West fully understood its virtues; research shows that artemisia (raw herb grown in China) remedies cure 90 per cent of patients in three days.

The new cure for malaria comes just in time. In the past decade, infection has risen sharply, killing three million people worldwide, most of them children under five. Another 300 million people who caught the illness now regularly suffer from high fevers. Sub-Saharan Africa, where millions have no access to reliable health care, bears the brunt: scientists estimate the average number of cases per year in Africa has quadrupled since the 1980s. Scientists call it the silent holocaust.

New strains of the malarial parasite which are resistant to older drugs have spread rapidly. The World Health Organisation (WHO) and international drug agencies now consider artemisia to be the most cost-effective solution. It works by destroying malarial parasites in the bloodstream.

The parasites are resistant to most existing anti-malarial drugs, but artemisia's structure is so different from other anti-malarial drugs that the parasite does not recognize it.

In April, the Global Fund, the WHO, the World Bank, Unicef and the United States Agency for International Development called on malaria-prone countries to phase out older drugs like chloroquine and use multi-drug combinations containing artemisia or its derivatives.

But already there are problems. The rising demand for the drug has led to a worldwide shortage. Prices have quadrupled and the few companies that make the medicine have cut back production. The price of artemisia was about #60 a pound, but as soon as the international agencies made their requests, prices shot up to around #210 a pound. (It's about who is making the money!)

Novartis, the Swiss pharmaceutical company, now says it can produce only half the 4.5 million courses of the Co-Artem drug it promised to make for the WHO, because its supplier in China has not grown enough of the plant. Drug companies in India have said they are willing to pay any price for the plant. As a result, many countries, including Ethiopia, which were encouraged to adopt artemisia-based drugs, will have their supplies rationed. (The first excuse: there's not enough herb available.)

All this is happening in tandem with another approach to the problem. In Ethiopia, people working with the British charity Send a Cow began experimenting with artemisia four years ago. They acquired seeds from a European organization - Action for Natural Medicines - and discovered the plant grows well in the cool, clear air of Ethiopia's southern highlands. Send a Cow covered the initial costs and provided training for farmers to grow, package and sell the medicine in the lowlands, where malaria is a common killer. They are trying to persuade Ethiopia's Ministry of Health to recognize their work and to look at ways of developing the drug, instead of buying it from European pharmaceutical companies."

It's infuriating to read how Novartis cannot find enough artemisia when our farmers are growing it in their backyards," said Theopholus Tesfaye, an agriculturalist working with Send a Cow Ethiopia.

"The Ethiopian government buys in expensive medicines derived from Artemisia when the crop is growing in its own country. We need to go and persuade them to rethink their policy." (Who profits from this?)

In the meantime, in Chench, a town consisting of a row of shacks and tiny farms dotted around the mountainside, an artemisia cottage industry is growing fast. Farmers grow rows of the delicate plants in their back gardens, and Send a Cow provides advice on when to harvest the crop and how to process it. They use the money they gain from selling the medicines to buy livestock, apple saplings and clothes for their children.

The people who buy the treatments are grateful, too. Before they had access to a regular supply of artemisia, anyone who caught malaria would have to trek for miles to reach the nearest clinic. Even if a family could afford to pay for it they would not be guaranteed treatment, as the clinics often ran out of medicines.

"The artemisia plant has given this region a whole new industry," said Mr Tesfaye. "We may not have national recognition yet, but at least we can help our immediate community to fight malaria."

Mr Orcho, who retired from the Ministry of Health three years ago, is one of the linchpins of the system. He sells each course of seven-day treatments for 5 birr - an affordable amount for most families. Yet he has still managed to earn 3,380 birr in a year. When he worked for the government, he earned just 1,400 birr a year.

Information taken from an article:

Via NY Transfer News Collective * All the News that Doesn't Fit

By Meera Selva in Chench, Ethiopia

**Medical Conference
Nairobi, Kenya
June 2007**

PROFIT MOTIVE

In 2004 the Chinese herb was known to be effective, but lacked a profit motive. So, synthetic compounds (ACT's) were patented trying to create profit opportunities.

Highlights (Taken from New York Times Article)

“world health agencies are racing to acquire 100 million doses of a Chinese herbal drug that has proved strikingly effective against malaria”

“cut the death rate by 97 percent in a malaria epidemic in Vietnam in the early 1990's.”

“UNICEF and the World Bank have embraced Artemisinin”

"Kenya 1997... fakes were found... favors giving artemisinin [as a way] to remove the counterfeiters' profit motive "

“As a plant material, artemisinin cannot be patented, said Dr. Allan Schapira, a policy specialist for the Roll Back Malaria campaign of the World Health Organization. Nor can the simple extraction process. Some synthetics, he said, are old and off patent, which public health officials like but pharmaceutical companies do not, because they make a larger profit from drugs on which they have patent monopolies.”

Chinese Herbs Best Alternative

May 2004

After years of hesitation, world health agencies are racing to acquire 100 million doses of a Chinese herbal drug that has proved strikingly effective against malaria, one of the leading killers of the poor.

More and more strains of malaria are developing resistance to the two most-used malaria drugs. Artemisinin is rapidly replacing quinine derivatives and later drugs against which the disease has evolved into resistant strains.

The drug, artemisinin (pronounced are-TEM-is-in-in), is a compound based on qinghaosu, or **sweet wormwood**. First isolated in 1965 by Chinese military researchers, it cut the death rate by 97 percent in a malaria epidemic in Vietnam in the early 1990's.

UNICEF, the United Nations Children's Fund, which procures drugs for the world's poorest countries, opposed its use during an Ethiopian epidemic last year, saying that there was too little supply and that switching drugs in mid-outbreak would cause confusion.

But now almost all donors, Unicef and the World Bank have embraced the drug. The new Global Fund for AIDS, Tuberculosis and Malaria has given 11 countries grants to buy artemisinin and has instructed 34 others to drop requests for two older drugs — chloroquine and sulfadoxine-pyrimethamine — and switch to the new one.

"We want countries to move very rapidly to use it as a first-line treatment," said Dr. Vinand Nantulya, the fund's malaria adviser. The fund expects to spend \$450 million on the drug over the next five years, he said.

The World Health Organization, a United Nations agency based in Geneva, estimates that 100 million doses will be needed by late 2005.

Malaria causes about 300 million illnesses a year, and at least 1 million deaths, 90 percent of them in Africa and most of them children under 5. Despite more than a century of eradication efforts, the disease is endemic from the Mekong Delta in Vietnam to the Amazon Basin in Brazil, and is particularly severe across central Africa, from the cane fields of Mozambique to the oases of Somalia to the rubber plantations of Liberia.

Artemisinin is a fruit of military research. Chinese scientists first isolated it in 1965 while seeking a new antimalarial treatment for Vietnamese troops fighting American forces.

Two years ago, Dr. Dennis Carroll, a health adviser to the United States Agency for International Development, said artemisinin was "not ready for prime time." But on April 30 at a malaria conference at the Columbia University School of Public Health, he led a session on ways to induce farmers to plant more wormwood.

Dr. Carroll said that more evidence had emerged that the drug was safe and that older drugs were not working. Also, the creation of the Global Fund expedited grants for it.

Dr. Stewart Tyson, a health expert with the British Department for International Development, said his agency changed its opinion about the drug after its experience in Uganda, where resistance to older drugs had climbed to 31 percent in some areas in 2003 from 6 percent in 2000.

The price of artemisinin cocktails has fallen from \$2 per treatment to 90 cents or less as more companies in China, India and Vietnam have begun making them. (Older drugs cost only 20 cents.) Novartis, the Swiss drug giant, sells its artemisinin-lumefantrine mix, Coartem, to poor countries for 10 cents less than it costs to make, a company official said. The same drug, under the name Riamet, is sold to European travelers for about \$20.

As a plant material, artemisinin cannot be patented, said Dr. Allan Schapira, a policy specialist for the Roll Back Malaria campaign of the World Health Organization. Nor can the simple extraction process. Some synthetics, he said, are old and off patent, which public health officials like but pharmaceutical companies do not, because they make a larger profit from drugs on which they have patent monopolies.

No company has registered artemisinin in the United States, said Dr. Nick White, a professor of tropical medicine at Mahidol University in Thailand, because sales would be too small to justify the cost of seeking approval from the Food and Drug Administration.

Now, with more purchases, fears of a shortage that would push prices up are developing. The W.H.O. estimates that 100 million doses will be needed by late 2005, and the world now has only about a third of that.

Though it grows wild even in the United States, wormwood is cultivated only in China, Vietnam and pilot projects in Tanzania and India. It is planted in December and needs eight months to mature. Drug companies want firm orders from donors before they try to triple production.

Even if enough artemisinin can be made, obstacles will arise, experts warned. For example, Dr. Kopano Mukelabai, a malaria specialist at Unicef, said shopkeepers would have to be trained not to sell one or two pills to patients who lacked the money for a full course of 12.

And what Richard Allan, director of the Mentor Initiative, a public health group that fights malaria epidemics, called "the love of chloroquine" will have to be broken. That quinine derivative, in use since the 1950's, is now almost useless against parasites, but poor people still buy it because it is cheap and lowers fever as aspirin does.

Also, counterfeiting will become a problem. In Kenya in 1997, Mr. Allan said, he found 120 versions of sulfadoxine-pyrimethamine for sale, "ranging from very good drugs to talcum powder." A recent study of artemisinin drugs in Asia "found that 38 percent were fakes," he said. "We can expect the same thing to happen in Africa."

He favors giving artemisinin [as a way] to remove the counterfeiters' profit motive.

Taken from: Artemisinin, Herbal Drug Is Embraced in Treating Malaria

DONALD G. McNEIL Jr. / NY Times 10may04

<http://www.mindfully.org/Health/2004/Artemisinin-Sweet-Wormwood10may04.htm>

Referencing Doctors Without Borders

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