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FILE: ▪Sweet Annie (*Artemisia annua*)
▪Artemisia
▪Malaria

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RE: Herb-based Anti-malaria Drug Center of International Dispute

McNeil Jr. DG. New Drug for Malaria Pits U.S. Against Africa. *New York Times* May 28, 2002.

A relatively new anti-malarial drug, artemisinin, is the subject of controversy between African and World Health Organization (WHO) officials and the U.S. Agency for International Development (AID) advisors. African and WHO officials favor rapid adoption of artemisinin. AID and the U.S. Centers for Disease Control and Prevention (CDC) spokesmen advocate its use only in cases not helped by other drugs, saying that artemisinin needs more testing in infants, is more expensive, and more difficult to use properly than current drugs.

Thirty years ago in China, artemisinin was refined from *Artemisia annua,* known in that country as *qinghaosu* and in the U.S. as sweet wormwood, Chinese wormwood, or sweet Annie. Wormwood has been used to treat fevers for 2,000 years. The plant grows widely in China, Vietnam, and the U.S. In Vietnam, deaths from a malaria epidemic were reduced by 97% over five years using bed nets, indoor DDT spraying, and artemisinin. In a South African study, malaria deaths dropped 87% in one year when artemisinin was used.

The drug treats malaria and reduces the intensity of epidemics by leaving treated persons with a sterile form of the disease, giving them immunity. Resistance to current anti-malarial drugs is "a huge problem," says Dr. Kamini Mendis, an official with WHO's Roll Back Malaria project. "There are not many drugs in the pipeline because it's not a rich man's disease," he adds. A 1996 study found that $42 per death is spent in malaria research, compared with $840 per death for asthma and $3,360 per death for AIDS research.

Malaria affects 90 countries with more than 300 million cases annually, and more than one million are fatal. Over 2,000 African children die of malaria daily. Children may have several bouts with the mosquito-borne parasite every year and often die of anemia. Survivors may be mentally retarded. Families affected by malaria clear 40% less land than healthy families. Malaria also deters tourism and financial investment in affected countries.

Resistance to chloroquine and sulfadoxine/pyrimethamine (S/P), the current anti-malarials, is reported to be 90% to chloroquine in some areas and up to 60% to S/P. Experts now believe the most effective anti-malarials are mixtures of drugs, or cocktails, such as are used for AIDS. An artemisinin-containing cocktail

from Swiss multinational Novartis sells for $20 per treatment in developed countries, and to WHO, for use in poor countries, at $2 per dose. Doctors Without Borders, an international medical assistance organization, believes it can obtain a similar combination for $1.30 per dose. In contrast, chloroquine and S/P cost as little as 20¢ per adult treatment. Since most African countries cannot buy any drugs without financial help, switching to artemisinin would be costly.

Also, most Africans purchase anti-malarials from small stores and peddlers rather than by prescription. Dr. Fred Binka, professor of epidemiology at the University of Ghana, who advocates making the change, says that these "de facto pharmacists" would have to be retrained to give advice on using artemisinin. While chloroquine is usually taken three times daily for three days, and S/P is a one-dose medication, artemisinin is taken four times daily for three days, preferably with milk. Because it rapidly stops aches and fever, patients who cannot afford 12 pills, or milk to go with them, may stop taking it too soon, leaving resistant parasites to be transferred to another victim.

In countries like Zambia, however, where malaria is the "number one killer" and chloroquine is nearly useless, U.S. reluctance to endorse artemisinin fuels dismay and anger. Dr. Rosemary Sunkutu, Zambia's public health director, says that for only $8 million, Zambia could switch to Novartis' artemisinin cocktail "and substantially reduce the number of children who would die." WHO officials are walking a fine line, acknowledging U.S. cautions, yet seeking to get artemisinin into circulation before the waning effectiveness of S/P is exhausted.

— Mariann Garner-Wizard