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Words: 905 approx.

A COMMON WEED AGAINST BILHARZIASIS

by ROWAN SHIRKIE

*With financial assistance from Canada's International Development Research Centre, researchers in Egypt are pitting a common weed against bilharziasis, a debilitating disease. Supporting research into biological and environmental methods of controlling major tropical diseases is one of the ways that the IDRC is working to improve health in rural areas of developing countries.*

Bilharziasis is a chronic, insidious disease currently affecting more than 200 million people in Africa, Asia and Latin America. Next to malaria, it poses the greatest threat to human health in the tropical and subtropical regions of the world.

In Egypt where up to 50 percent of the population is affected by bilharziasis, the disease is an ancient enemy. Scientists have discovered the evidence of schistosome eggs in mummies nearly 4 000 years old. The disease is particularly aggressive here because of the extent of irrigated agriculture with its innumerable waterways and standing bodies of water. The snails that transmit the disease prefer slow-moving or static shallow water such as the shores of lakes, ponds, irrigation ditches and rice paddies. Thus, farmers who irrigate their lands, women who wash clothes at a stream or pond, and children who play along the shorelines of lakes and canals constantly risk contracting the disease. It is an everyday illness, tied to normal human activity.

The disease is caused by parasitic worms or blood flukes, known as schistosomes, that live and breed in the blood vessels of the intestines or urinary tract of its human hosts. Bilharziasis is a debilitating disease. In its later stages, it damages the ureters, kidneys, bladder, liver, and

other body tissues. The sufferer becomes emaciated and weak. The disease kills, if not directly, then by lowering resistance to other infections. Because of its progressive, slowly developing nature, bilharziasis drains the energy of its host. That is perhaps the disease's greatest toll. The social and economic burden of millions who are incapacitated and unable to function properly in fields, factories or homes is enormous.

The conventional method of control is to eliminate the snails that transmit the disease by destroying their environment through massive watercourse clean-up operations and the application of chemical molluscicides. Both methods are expensive and the chemicals used are generally toxic to humans and other life form in the water besides the snails. Researchers from the Department of Tropical Public Health of the High Institute of Public Health in Alexandria, led by Department Chairman Dr M.M. El-Sawy, are now investigating a unique method of snail control, with the financial assistance of Canada's International Development Research Centre.

Dr El-Sawy is experimenting with a common weed that grows throughout Egypt and the Mediterranean region. Part of the ragweed family, Ambrosia maritima (damassissa, as the plant is commonly called in Arabic) produces a powerful molluscicide in its leaves and flowers. Damassissa has had a place in Egyptian folk medicine for some time. Infused and taken as a tea, it is held to be beneficial as a stimulant, an aid to digestion and the heart, and in eliminating kidney stones. However, if Dr El-Sawy's hypothesis is correct, damassissa may have a much greater impact on health when applied externally... in waterways to kill snails.

Under laboratory conditions, infusions of 1:1000 part damassissa to water resulted in the complete mortality of the common snail-hosts of bilharziasis. The plant's potency lasted for two days and also had a lethal action on the eggs and larvae of the schistosome. The active snail killing agent of the plant is water soluble and therefore does not need any special method of manufacture.

Dr El-Sawy's research suggests that farmers need only grow damassissa along the banks and shores of waterways, and when the plant matures, simply

bend or cut them into the water. The weed is thus a cheap molluscicide that is safe to handle, has an established place in the local ecology, and does not appear to have any harmful side effects on either fish or livestock. It even matures at the peak snail breeding period, during the summer.

Dried damassissa appears to be as effective as the green plants and retains its potency for a number of years. If establishing damassissa along the irrigation canals where it might compete with food crops should prove undesirable, it could be grown elsewhere, dried, stored and applied as needed.

Compared with other methods, biological control of the snails seems very attractive. The Chinese have enjoyed considerable success in their campaign against the snails, but to dig out and clear their waterway habitats requires the mobilization of a massive workforce. Chemical means are expensive and are toxic to humans, fish, plants and livestock.

There are presently no effective means of providing mass treatment to those suffering from bilharziasis. The available drugs are not efficient, tend to have harmful side effects, and are difficult to administer. The prevailing rate of cure is only 20 to 40 percent and relapses and reinfections are common. (Recent research in the United Kingdom may have uncovered a promising lead in the development of a vaccine. The discovery revolves around a type of human blood cell known to increase in bilharziasis sufferers. The possibility of any sort of mass immunization program, however, is a long way off.)

In the long term, establishing improved sanitation practices to stop disease transmission from improper waste disposal is a major goal along with securing safe water supplies. In the meantime, using damassissa to control the snail hosts of the disease offers a more immediate, inexpensive and practical method of control. If Dr El-Sawy and his colleagues can establish that the plant can adequately fulfill this promise, there is a real chance that the burden of bilharziasis may begin to lift.

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IDRC-F83e

August 1978.