

## THAI RESEARCHERS ANALYZE NATURAL DRUGS...

BANGKOK—Khun Sasithorn Wasuwat is in a race against time.

The Director of the Pharmaceuticals and Natural Products Department at the Thailand Institute for Scientific and Technological Research (TISTR) is trying to track down as many herbal medicines as possible before they disappear forever under the onslaught of ecological destruction.

This is not a matter of preserving a few quaint remedies used only by backward villagers. In Thailand, as in many other countries, forests are being cut down by loggers and farmers or are flooded by power dam engineers. Many of the plant species thereby threatened are the sources of rare and vital drugs.

Many doctors have forgotten that about 47 percent of modern drugs were derived from medicinal plants. As a result, the science of pharmacognosy—the study of the medicinal properties of plants, animals, and minerals—has been neglected. Sasithorn's most useful reference on the subject is a book last revised in the 1940s. And she is worried, not so much about "...the medicinal plants we know how to use, but also those used traditionally which we are still not aware of. Since we relied on synthetic drugs, we seem to have forgotten the good Thai traditional medicines that will now disappear."

The natural source of at least one vital drug is now threatened by deforestation. Snake root (*Rauwolfia serpentina*), the source of a hypotension drug developed at the Institute in 1968, grows only in shade at high altitudes. The forested hills of northern Thailand, which once provided ideal growing conditions for the species, have now been largely denuded by logging and by slash-and-burn agriculture.

Preserving and utilizing medicinal plants makes good economic sense for Thailand, too. Out of a total current trade deficit of about 70 billion baht (U.S. \$2.8 billion), drug imports contribute about 14 percent, or 10 billion baht (U.S. \$400 million). Sasithorn is convinced that natural pharmaceuticals hold great potential not only as import substitutes, but also as export earners.

Over cups of ginger, safflower, and chrysanthemum tea—for which TISTR helped establish industry production standards—Sasithorn talked about two products already on the market.

For at least 600 years, garlic has

been favored as a medicine for certain skin diseases, dysentery, asthma, and blood defects. Scientists have proved that the odoriferous bulbs have anti-bacterial and cholesterol-reducing properties. Garlic Natura® was developed by TISTR and is now being produced and marketed by a Thai company. Unlike other brands of garlic capsule for which the whole bulb is pulverized, Garlic Natura contains no oil residue or fiber and is water soluble. The TISTR-developed capsule is supposed to be as potent as fresh garlic—without any of the socially unacceptable side effects. Sasithorn says one capsule is as effective as six to eight of those already on the market.

The second product is produced from phlai (*Zingiber cassumunar* Roxb.), a plant unique to Thailand. The plant was screened according to descriptions of its benefits in traditional Thai herbologists' texts. The result is Plygesal®, an analgesic, anti-

inflammatory cream for muscular pain, bruises, and sprains. (This author found it also works wonders on mosquito bites.) The product is currently being test-marketed in Thailand.

TISTR's natural products department is also developing anti-cancer, anti-bacterial, and anti-fungal natural medicines to prevent infections or cure conditions like athlete's foot. Moreover, the department has found that sugar cane wax makes a good cosmetic base and that a by-product of the rice bran oil industry acts as a growth agent. These are just two examples of efforts by the department to find uses for the natural waste products of various processing industries.

For Khun Sasithorn, that's what it's all about. "My greatest interest is to devote myself to work for such a thing instead of leaving all that raw material to become waste."

—Mark Timm

### NEW AGREEMENT

## ...AS UPJOHN STUDIES EXTRACTS FROM CHINESE HERBAL CURES

KALAMAZOO, Mich.—Upjohn plans to screen and develop 10 compounds isolated from ancient Chinese herbal medicines. Under a one-year contract signed recently with the Shanghai Institute of Materia Medica, the U.S. drug firm will subject the chemicals—which are being supplied in a purified form—to both chemical and biological assays. Upjohn says it is particularly interested in cancer, cardiovascular disease, and disorders of the central nervous system. The Shanghai Institute already provides a different group of compounds to Japanese researchers for a similar purpose.

Ralph E. Christoffersen, who directs Upjohn's biotechnology unit and who led discussions with the Chinese, points out that in one sense the testing is not novel: Upjohn tests many chemicals from many sources for potential therapeutic activity. But these particular substances *already* have proven benefits—and they have been demonstrated safe for humans through thousands of years of use.

In fact, plants may represent a largely untapped resource for the development of new drugs. It has been estimated that only 5–15 percent of the 250,000–750,000 existing plant

species have been assayed for any biological activity—and many of those that have been screened have only been examined for a single kind of activity. The largest U.S. effort to screen plant extracts was carried out by the National Cancer Institute between 1960 and 1981. This program looked at 120,000 plant extracts that were derived from 35,000 different plant species.

Christoffersen reports that the Chinese already know the molecular composition (if not the three-dimensional structure) of all the compounds, but that the substances will be novel to U.S. researchers. Upjohn has yet to consider how it may eventually decide to produce the compounds. "Some will be easy to synthesize chemically," Christoffersen concludes, "and some will not."

Upjohn intends to secure patent protection for any compounds that appear useful, after which its scientists will publish their findings. If any of the compounds are developed into marketable substances, Upjohn will pay royalties back to the Shanghai Institute. That the ancient cures will have any significant advantage over modern drugs, however, will have to be shown.

—Arthur Klausner