



[Vol. 21, No. 2 \(July 1993\)](#)

---

## **A Natural Path to Pesticide: Botanical Pesticides in Thailand**

*by John Eberlee*

Long before synthetic pesticides were invented, farmers around the world had their own home remedies against harmful insects. Typically, they would crush the leaves of a poisonous plant, dissolve them in water, then spray the solution on their crops.

The old ways fell into disuse with the advent of synthetic pesticides. One or two applications of pesticides enabled farmers to rid their fields of insect predators throughout the growing season. This approach seemed convenient, effective and economical.

But scientists now realize that synthetic pesticides have many hidden costs. According to World Health Organization estimates, up to 20,000 people die of pesticide poisoning in the Third World each year. And some synthetic pesticides are accumulating in soil and groundwater where they threaten the health of entire ecosystems.

To make matters worse, synthetic pesticides are rapidly losing their effectiveness. To date, hundreds of insect species have developed resistance to at least one pesticide formula and a dozen or so species are immune to them all. Some scientists fear that pesticide manufacturers will eventually be unable to outwit insects.

Enter Pichaet Wiriyachitra, a pharmacologist at Chiang Mai University, Thailand and Bernard Philogene, a botanist at the University of Ottawa. With funding from IDRC, they are coordinating a search for natural alternatives to synthetic pesticides. Since 1989, they and their colleagues have investigated dozens of plants used traditionally by Thai farmers to repel insect herbivores.

In Thailand, botanical pesticides are becoming increasingly attractive since the natural substances tend to be safer and more environmentally friendly than synthetic products, says Dr Philogene. Moreover, by developing a botanical pesticide industry, Thailand could reduce its imports of synthetic pesticides, valued in 1988 at around \$70 million.

Botanical pesticides also offer various means of combatting insects resistant to products currently available. Almost all synthetic pesticides rely on neurotoxic agents, meaning they attack the nervous system of insects. But tropical plants have over time developed literally thousands of weapons that kill insects in other ways. For example, the makabuhay vine, which grows in the Philippines, burns insects using a chemical that absorbs sunlight.

The IDRC-supported team has isolated two natural products that appear to have commercial potential. One substance, dubbed "Insect Kill," destroys the eggs of feeding insects. The other, called 'Stop Feed', suppresses their appetite. "We have given them code names because if we revealed which plants they come from, we might not be able to obtain patents," explains Dr Philogene.

The next step is to conduct toxicological studies to satisfy pesticide registration requirements. "You have to demonstrate that the compound is not only effective against insects but is also non-toxic to non-target organisms, such as birds, fish and mammals," says Dr Philogene. This work, which is being divided between labs in Canada, the United States and Thailand, could take several years to complete.

Assuming the research stays on track, Dr Philogene says he believes this project will ultimately benefit not only Thailand but most agricultural nations. From Canada's perspective, once a new product has been patented, "we can test it with the aim of using it on our own fields."

**FOR MORE INFORMATION, CONTACT:**

Dr Pichaet Wiriyaichitra  
Research Centre for Natural Products  
Faculty of Pharmacy  
Chiang Mai University  
130 Huay Kaew Road  
Chiang Mai, 50002 Thailand

Dr Bernard J. R. Philogene  
Dean, Faculty of Science  
University of Ottawa  
32 George Glinski Street  
Ottawa, Ontario, K1N 6N5  
Tel: (613) 564-2407

---

Unless otherwise stated, all articles and photos may be freely reproduced providing suitable credit is given.

ISSN 0315-9981. This magazine is listed in the Canadian Magazine Index.

- [Subscription information](#)
- [Return to the IDRC Reports homepage](#)
- [Return to the IDRC homepage](#)

Copyright © International Development Research Centre, Ottawa, Canada  
Please send your comments to [editor of Reports](#).