

## **I. Background of initiation of the research project on virus diseases and outline of research achievements**

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With the progress made in research on rice cultivation in Southeast Asia, some of the symptoms attributed to physiological disorders of rice were eventually identified as being associated with virus diseases. Tungro disease of rice is a good example. Through such information, it was recognized that the virus diseases of rice were hampering rice production in Southeast Asia.

Therefore, with this in mind, the Tropical Agriculture Research Center (TARC), Ministry of Agriculture, Forestry and Fisheries, Japan, dispatched scientists to Thailand and Sri Lanka (at that time Ceylon) and initiated studies on the diagnosis and ecology of virus diseases, which affected rice and other important crops.

TARC also held an international symposium on virus diseases of tropical crops in September, 1976, in Tokyo, inviting researchers from various tropical countries.

The results of the discussions emphasized the importance of virus diseases, and the need for further information on virus diseases, occurring in the tropics in taking account of the shortage of manpower and lack of sophisticated facilities for viral studies in the tropical countries. Therefore, the identification of the virus diseases occurring in the tropics was given priority and the selection of test plants and introduction of serological methods were promoted.

On the other hand, Waika-disease of rice occurred in Kyushu, Japan from about 1972, and it was reported that the causal agent was closely related to the pathogen of tungro disease of rice. Since then, Japanese virologists became increasingly interested in the virus diseases prevailing in the tropics.

Therefore, TARC eventually decided to initiate a research project on virus diseases in collaboration with institutes of various Southeast Asian countries and the Institute for Plant Virus Research (IPVR) of Japan for a 5-year period, starting in 1978.

### **1. Objective of the research project**

For the increase and stabilization of crop production in the Southeast Asian countries, it is necessary to develop control techniques of virus diseases, which are one of the important factors hampering crop production. Therefore, the project aimed at studying problems relating to the identification and ecology of rice and legume virus diseases for the establishment of basic control techniques.

The research project included the following aspects:

#### **1) *Rice virus diseases***

- (1) Identification of rice virus diseases in Southeast Asia
- (2) Preparation of antisera against rice viruses
- (3) Comparison of properties of causal viruses in different countries
- (4) Ecology of insect-vectors of rice viruses

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- (5) Development of measures to control rice virus diseases

## **2) Legume virus diseases**

- (1) Identification of legume virus diseases in Southeast Asia
- (2) Preparation of antisera against the major viruses
- (3) Comparison of properties of causal viruses in different countries
- (4) Ecology of occurrence of legume virus diseases

## **2. Countries and organizations selected for the implementation of the project**

As a core organization and location for the implementation of the project in the Southeast Asian countries, the Department of Agriculture of Thailand, Bangkok, Bangkok was selected for the following reasons:

- (1) The Department of Agriculture has a long history of collaborative research with TARC.
- (2) The Department has enough space and good facilities (such as electricity and water supply) for setting up modern equipment, for example an electron microscope and an ultracentrifuge for plant virus research.
- (3) In Thailand rice and also many kinds of legumes are cultivated widely and the occurrence of virus diseases on these crops has been observed.

Besides, as the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India had proposed to TARC to undertake collaborative studies on peanut virus diseases, ICRISAT was also selected for the implementation of the project. To carry out the collaborative studies, it was decided that a virologist and an entomologist would stay at the Department of Agriculture, Thailand and a virologist at ICRISAT, India with long-term assignments. Also several virologists and entomologists were sent to other Southeast Asian countries with short-term assignments for observing the occurrence of virus diseases and vectors.

On the other hand, basic studies on virus diseases, such as purification of virus and preparation of antisera against virus which require sophisticated facilities and equipment were carried out at the Institute for Plant Virus Research (IPVR) in close contact with TARC.

The Head of the Second Research Department of IPVR, Dr. Y. Saito was designated as the project coordinator to supervise the implementation of the project in collaboration with the Associate Director for Research of TARC (Dr. T. Kajiwara and Dr. S. Konno).

Meetings for the evaluation of the results and selection of further research subjects were held at least once a year with the participation of the staff members of TARC and IPVR, and several professors of virology and entomology from various universities in Japan.

In this regard we would like to express our gratitude to the staff members of the Department of Agriculture, Thailand, and ICRISAT, and other organizations from the Southeast Asian countries for their kind cooperation and assistance in the project. We also thank the members of IPVR, Japan, especially the Directors of IPVR (Dr. H. Kitajima, the late Dr. Y. Komuro and Dr. S. Yoshimura) and Dr. Y. Saito for their support and useful suggestions.