

Aquatic Weed Problems And Control In Southeast Asia

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ABSTRACT

A review of the aquatic weed problems and control in Southeast Asian countries, with special reference to the work of the Tropical Pest Biology Program of the Regional Center for Tropical Biology (BIOTROP), including a summary report on the Southeast Asian Workshop on Aquatic Weeds held at Malang, Indonesia on June 25 to 29, 1974 and its research and training activities regarding aquatic weed problems, is presented.

INTRODUCTION

The Southeast Asian Ministers of Education Organization (SEAMEO) is the organization of the Ministers of Education of eight Southeast Asian countries, namely: Indonesia, Khmer, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam. In order to foster regional cooperation in education and science, the organization has established six regional centers in specific fields determined to be most important to the expanding educational needs of the region. The Regional Center for Tropical Biology located in Bogor, Indonesia is concerned among others with aquatic weed problems.

Research conducted by BIOTROP staff, research scholars from the SEAMEO member countries, and graduate students include the preparation of weed species identification sheet (SIS), inventory of weed populations, autecological studies of waterhyacinth, *Salvinia* spp., water lettuce, torpedo grass, and sexual reproduction studies particularly with waterhyacinth and water lettuce. Control studies are limited to the common herbicide effects on *Salvinia* spp. and water lettuce and on rice production.

The possible use of waterhyacinth and *Salvinia* spp. for cattle feed is a joint project with the Faculty of Animal Husbandry at Bogor Agricultural University. In cooperation with the Commonwealth Institute for Biological Control Substation, Sabah, East Malaysia, the natural enemies of some common aquatic weeds in Southeast Asian region are being evaluated.

SOUTHEAST ASIAN WORKSHOP ON AQUATIC WEEDS

A Workshop was organized by BIOTROP in cooperation with the Brantas River Multipurpose Project of the Ministry of Public Works and Electric Power of the Republic of Indonesia, and held June 25 to 29, 1974. About 95 people involved in the study of aquatic weeds and associated problems gathered at the Karangates Dam Site

near Malang, East Java, to share ideas and formulate proposals on this subject. The objectives of the Workshop were: (1) to assess and map out aquatic weed infestation in SEAMEO member countries; (2) to evaluate particular control measure wherever tried which will serve as a basis in formulating control recommendations; and (3) to collect basic data and formulate guidelines for future aquatic weed research. Participants in the Workshop came from all the member countries of SEAMEO and were supplemented by visiting experts from outside the region (India, Japan, Netherlands, Sri Langka, United Kingdom, and United States of America). The Workshop began with country reports from the eight member countries of SEAMEO and information was presented on the major aquatic weed problems, control measures used and methods of utilization. From these reports and from an analysis of answers to the questionnaire sent out by BIOTROP to persons involved in aquatic weed research in Southeast Asia, it is found that aquatic weed problems in Southeast Asia are generally associated with weed problems in lowland ricefields. It can also be concluded that mechanical control method is most widely practiced in the region, while chemical control is utilized less. The major aquatic weed species in the region is presented in Table 1.

Utilization and control of aquatic weeds were discussed. Particular attention was given to the desirability of taking preventive measures to decrease the possibility of serious and expensive outbreaks of weed problems. The need was stressed for cooperation between experts in a number of

TABLE 1. OCCURRENCE OF AQUATIC PLANTS IN SOUTHEAST ASIA RANKED ACCORDING TO THE DEGREE OF PROBLEMS THEY CAUSE WITH WATERHYACINTH AS THE MOST TROUBLESOME.^a

Common name	Scientific name	Occurrence (number of countries)
Waterhyacinth	<i>Eichhornia crassipes</i> (Mart.) Solms	8
Molesting salvinia	<i>Salvinia molesta</i> D.S. Mitchell	3 ^b
Kariba weed	<i>Pistia stratiotes</i> L.	8
Hydrilla	<i>Hydrilla verticillata</i> (L.f.) Royle	8
Sacred lotus	<i>Nelumbo nucifera</i> Gaertn.	8
Giant bulrush	<i>Scirpus grossus</i> L.f.	8
Torpedo grass	<i>Panicum repens</i> L.	8
Narrow leaf cattail	<i>Typha angustifolia</i> L.	8
Monochoria	<i>Monochoria vaginalis</i> (Burm. f.) C.Presl	8
Cucullate salvinia	<i>Salvinia cucullata</i> Roxb. ex Bory	7 ^c

^a present and potential problems

^b Indonesia, Malaysia, and Singapore

^c Indonesia, Malaysia, Singapore, Thailand, South Vietnam, Khmer Republic, and Laos.

disciplines, from weed scientists and engineers to economists. Finally the Meeting formulated four important recommendations.

1. It resolved to express strong support for the activities of the Food and Agriculture Organization (FAO) Plant Protection Committee for the Southeast Asian and Pacific region and to bring to its attention the urgent need for effective measures to prevent the international movement of noxious plants especially molesting salvinia (*Salvinia molesta* D.S. Mitchell) which is apparently limited to a relatively few countries in the region namely: Indonesia, Malaysia, and Singapore, as well as neighbouring countries such as Australia, New Zealand, India, and Sri Lanka.

2. The Workshop resolved that the questionnaire campaign to monitor aquatic weed problems should be continued and expanded. It is also recommended that this monitoring work should be included by the United Nations Environment Programme (UNEP) in its Global Environmental Monitoring System.

3. It was further resolved that, in order to deal with aquatic weeds in the SEAMEO region, international organizations such as FAO, United Nations Educational, Scientific and Cultural Organizations (UNESCO), Man and the Biosphere (MAB), International Hydrological Decade (IHD), and UNEP are requested to include aquatic weed problem in their respective programs and to consider and provide the necessary financial support to BIOTROP and other concerned institutions for promoting research and control of aquatic weeds.

4. It was further resolved that an international meeting on this subject be convened in cooperation and with the assistance of UNESCO (MAB and IHD) and FAO for comparison and exchange of ideas for workers in this field.

FUTURE PROGRAM ON AQUATIC WEEDS

A manual of Southeast Asian Aquatic Weeds is envisioned as a result of the inventory and detailed mapping of aquatic weed species in the region.

In the autecological and synecological research there is a need, when appropriate, to develop techniques of system analysis to facilitate understanding of complex ecosystems and to make possible the identification of critical or sensitive relationships. The work will include: reproduction and dispersal, plant growth rates and nutritional studies, competition and succession, etc. Furthermore the autecological as well as synecological studies will serve as an appropriate base for preventive measure programs.

For a proper resource management, standard techniques to assess economic losses caused by aquatic weeds will be developed. This should include studies on the qualitative as well as quantitative data on the optimum amounts and composition of aquatic vegetation in relation to fish production, relation to other pests as rats (*Rattus* spp.), snails (*Limnaea* spp.), etc.

Biological control methods will be encouraged in the near future and it is aimed at having suitable facilities to serve the need of the region for the full scale testing and introduction of insects for release on several of the major aquatic weed species.

Waterhyacinth Problems In The Fitzroy Region Of Central Queensland¹

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ABSTRACT

Waterhyacinth [*Eichhornia crassipes* (Mart.) Solms] is a serious problem in the Fitzroy Basin of Central Queensland. Because it is proving extremely difficult to control, various methods of control in the river and lagoons are discussed, together with the possibility of it being harvested, and used as a cattle feed during periods of drought.

¹Location: North-eastern coast of Australia on the Tropic of Capricorn.

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INTRODUCTION

Waterhyacinth has become a troublesome weed in stationary, or slow-flowing fresh waters in tropical and subtropical areas throughout the world, including Australia. In common with other places, the plant affects the ecological balance of infested waters (6), increases water loss through evaporation (20), aggravates the mosquito problem (16), and interferes with river traffic (25). The problem is magnified by rapid proliferation of the plant (10), and yet the weed has favorable attributes (17, 19).

Waterhyacinth spread to the State of Queensland from