

**WORLD HEALTH  
ORGANIZATION**

**Regional Office  
for the Eastern Mediterranean**



**ORGANISATION MONDIALE  
DE LA SANTÉ**

**Bureau régional  
pour la Méditerranée orientale**

TRAVELLING SEMINAR ON THE USE OF  
LARVIVOROUS FISH FOR MOSQUITO  
CONTROL IN ANTI MALARIA CAMPAIGNS

EM/TR.SMR.LRV.FSH.MSQ.CTR/1

Bulgaria - 27.8. - 9.9.1979  
USSR - 9.9 - 15.9.1979

28 June 1979

REVISED PROVISIONAL AGENDA

1. Opening of the Seminar
2. Election of Officers
3. Adoption of the Agenda
4. Introduction
5. Brief review of epidemiology of malaria
6. Vector control measures in anti-malaria campaigns
  - 6.1 During adult stage
  - 6.2 During larval stage
7. Use of biological agent with special reference to larvivorous fish
  - 7.1 History of the use of fish for larval control (global)
  - 7.2 History of the use of fish for larval control (EMR)
  - 7.3 Important species of fish used for larval control in EMR
  - 7.4 Taxonomy of important larvivorous fish
  - 7.5 Ecology of important larvivorous fish
  - 7.6 Biology of important larvivorous fish
8. Raising fish for distribution in mosquito breeding places
  - 8.1 Natural habitat
  - 8.2 Artificial habitat

9. Environmental impact on fish
  - 9.1 Predators of larvivorous fish and their control
  - 9.2 Effect of insecticides on larvivorous fish
  - 9.3 Effect of water quality on survival of larvivorous fish
  - 9.4 Effect of aquatic vegetation on larvivorous fish
  - 9.5 Effect of climate on larvivorous fish
  - 9.6 Effect of larvivorous fish on other sorts of aquatic life other than mosquito larvae
10. Operational aspects of the use of larvivorous fish
  - 10.1 Planning and organization
  - 10.2 Equipment necessary for raising, distribution and seeding of larvivorous fish
  - 10.3 Transportation of fish over long distances
  - 10.4 Seeding fish in mosquito breeding places
11. Evaluation of the work
  - 11.1 Physical evaluation (population density)
  - 11.2 Epidemiological Evaluation
    - 11.2.1 Entomological Evaluation
    - 11.2.2 Parasitological Evaluation
  - 11.3 Cost analysis
12. Training and research needs
13. Field observation and practice in Bulgaria and Georgian Republic of USSR
14. Case studies
15. Summary report and recommendations

**WORLD HEALTH  
ORGANIZATION**

**Regional Office  
for the Eastern Mediterranean**



**ORGANISATION MONDIALE  
DE LA SANTÉ**

**Bureau régional  
pour la Méditerranée orientale**

MESSAGE FROM DR A. H. TABA  
DIRECTOR  
WHO EASTERN MEDITERRANEAN REGION

to the

TRAVELLING SEMINAR ON THE USE OF  
LARVIVOROUS FISH FOR MOSQUITO  
CONTROL IN ANTI-MALARIA CAMPAIGNS

Bulgaria/USSR - 27.8.79 - 15.9.79

Excellencies, Dear Colleagues, ladies and gentlemen

It was my sincere wish to be present among you at the opening session of this important seminar on use of larvivorous fish for mosquito control in anti-malaria campaigns being held in this beautiful city. Regretfully, due to other commitments, it was not possible for me to share with you this interesting session. Nevertheless it is a great pleasure for me, on behalf of the World Health Organization, to welcome all the participants to this seminar. I would like to take this opportunity to pay special tribute to H.E. The Minister of Health and to the Government of Bulgaria for their acceptance to host the seminar and for collaborating so efficiently in making all the preparations and arrangements.

Malaria is an endemic disease in our Region. Since 1958 when the malaria eradication programme was launched in the countries of our Region, there have been significant changes in the strategies and approaches to control this disease. Although vector control through use of residual insecticide house spraying remains the main method for suppressing malaria transmission, there are some limiting factors for the chemical control of vectors. These factors are:

- malaria vectors resistance to insecticides commonly used in malaria control programmes
- the choice of alternative insecticides becoming narrower due to their higher cost and shorter residual effect
- toxic effects of insecticides on man, domestic animal and environment.

Consequently we must search for malaria control measures which are permanent, which do not pollute the environment and which are more economical. The use of larvivorous fish in biological methods of vector control as well as the practical aspects of engineering methods in source reduction, receive particular attention in our Region.

In early 1978 a seminar was held in Alexandria and Khartoum on the Prevention and Control of Vector-Borne Diseases in Water Resources Development Projects. In this Seminar engineering methods, including source reduction and water management which minimize the vector breeding places, were discussed in detail. Application of such methods are now being planned in some countries of the Region.

The objective of the present seminar is to hold discussions amongst responsible officers in anti-malaria projects on the needs and targets of biological control in malaria eradication and control programme, and to review latest developments regarding planning, implementation and evaluation of large scale utilization of larvivorous fish. Discussions will also include a review of various subjects such as specific situations which may or may not make introduction of fish successful, the species of larvivorous fish, (local and exotic) being used in malaria projects of the Region and their effectiveness, the effect of the environment on the fish and the prevention of undesirable effects on local aquatic fauna posed by the introduction of exotic species. Finally, particular attention will be paid to the role of the biologist in malaria projects and to the inter-relation between the work of the entomologist and that of the ichthyologist.

The presence of participants from different specialized professions i.e. entomologists, engineers, malariologists, operational officers and ichthyologists is appropriate in such a gathering and will provide a good opportunity for the exchange of views both amongst yourselves and with the scientists working on the same subject in Bulgaria and USSR. This, I am sure, will help towards a better appreciation and use of larvivorous fish as a biological agent in vector control in anti-malaria programmes.

I wish you all success in your deliberations during the meeting and field visits and an enjoyable stay in Bulgaria and the USSR.