



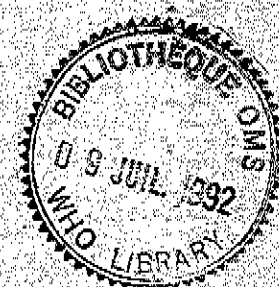
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SUMMARY REPORT

Consultation on Health Risks from Contaminants in Mediterranean Seafood (WHO/UNEP Joint Project, MED POL Phase II)

Athens
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1992

EUR/HFA target 20

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ABSTRACT

The risk to health from the consumption of shellfish contaminated with viruses or algal biotoxins is a major health problem in the Mediterranean region, particularly coastal areas. WHO and the United Nations Environment Programme (UNEP) convened a consultation within the framework of the Long-term Programme of Pollution Monitoring and Research (MED POL Phase II) of the Mediterranean Action Plan. Twelve experts from seven countries met to discuss the problem and recommend action. The participants recommended extensive research to describe the problem more fully and to improve research methodology and performance and urged WHO and public health authorities in the Mediterranean countries to support this work. Such work would provide the data needed for eventual measures that would protect human health while avoiding unnecessary damage to the shellfish industry, trade and tourism.

TARGET 20

WATER QUALITY

By the year 2000, all people should have access to adequate supplies of safe drinking-water and the pollution of groundwater sources, rivers, lakes and seas should no longer pose a threat to health.

Index:

SHELLFISH
FOOD CONTAMINATION
SEAWATER
WATER POLLUTION - adverse effects
RISK FACTORS
(1) UNEP
EUROPE

Introduction

In the Mediterranean region, particularly in coastal areas, the risk to human health from the consumption of shellfish and other seafood exposed to sewage pollution or to contamination by toxic algal species, presents a major health problem. Under the provisions of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources, discharges containing pathogenic microorganisms are strictly subject to the issue of an authorization by the competent national authorities. Further, the Contracting Parties to the Protocol agreed progressively to formulate and adopt, in cooperation with the competent international organizations, the common guidelines on and standards for the quality of seawater that are needed to protect human health and marine life and ecosystems.

A recent assessment prepared by WHO on pollution of the Mediterranean Sea by pathogenic microorganisms highlighted the need for a more comprehensive catalogue of such organisms (particularly viruses) in sewage effluent and marine areas known to be affected by such effluent, including shellfish grounds. Priority topics for research included the survival of viruses in seawater and their resistance to sewage treatment and depuration techniques. The problem of algal biotoxins in Mediterranean shellfish had arisen relatively recently and its extent was still largely unknown. More information was thus required, particularly on areas known to be subject to regular or sporadic eutrophication. In addition, more studies were needed on the effects of algal blooms on health, and the factors determining the concentration of biotoxins in shellfish.

To address this topic, WHO and the United Nations Environment Programme (UNEP) jointly convened a consultation within the framework of the Long-term Programme of Pollution Monitoring and Research in the Mediterranean Sea (MED PQL Phase II) of the Mediterranean Action Plan. Twelve temporary advisers from seven Mediterranean countries and one representative of the WHO Regional Office for Europe took part. The participants were microbiologists, virologists and toxicologists engaged in the determination of viruses and/or algal biotoxins in shellfish and the marine environment. The objectives of the consultation were:

- to review the problem of viruses and algal biotoxins in shellfish in the Mediterranean region;
- to identify the future work required; and
- to make appropriate recommendations.

Discussion

Viruses in shellfish

Both a comprehensive survey of existing records and field studies were needed to obtain region-wide information on the viral contamination of shellfish. Work on environmental virology was currently limited to relatively specialized laboratories. The expected future demand for the determination of viruses in shellfish would require more laboratories to do such work. This in turn would require the development of rapid, simple and relatively inexpensive screening procedures.

In addition, the participants discussed current methodology for the detection and measurement of viruses. They agreed that at least three laboratories should compare a number of procedures on a collaborative basis before any method was recommended. The participants also outlined such an exercise. It was agreed that priority research on viruses needed to concentrate on their survival in shellfish and sediment, their association with algal blooms, and the influence of particular environmental factors on their fate. Research was also needed on the efficiency of virus removal procedures, particularly shellfish depuration.

Further, the work performed so far showed no correlation between the concentration of a bacterial indicator and the presence of a virus. Bacteriophages (F+ coliphages and Bacteroides fragilis phages) appeared to have potent as indicators of viral contamination.

Algal biotoxins in shellfish

Eutrophication, with its consequent biological responses, constituted an increasing problem in certain areas, mainly the Northern Adriatic and some coastal areas with heavy urbanization or freshwater outlets. The problem was possibly being underestimated; as it affected local populations, tourists, and shellfish production and trade, however, proper surveillance of algal biotoxins was particularly important. The main requirements were an exhaustive literature survey on the occurrence of such biotoxins, and the compilation of a catalogue of Mediterranean microalgae that could be implicated in toxin production.

In addition, it was important to define the toxin content of the various algal species suspected of implication in shellfish poisoning, and to develop sensitive methodology to assess algae and shellfish. The current methodology for the detection of toxins in shellfish needed improvement, to ensure the safety of the consumer and to avoid unjustified damage to the shellfish industry, trade and tourism.

The participants discussed many aspects of the problem of algal blooms and the consequent accumulation of biotoxins in shellfish. They agreed on the main requirements for the improvement of sampling methodology, particularly for low-density algal populations, and for the development of forecasting systems based on the relationship between the presence of algae in the sea and that of toxins in shellfish. In addition, improved collaboration and sample exchange between laboratories could solve the problem of species identification. The use of mouse bioassay tests for toxin quantification needed to be minimized; the ELISA or other tests needed to be developed and evaluated for comparability and suitability as alternatives.

Finally, the participants agreed on the need for epidemiological studies on both virus outbreaks and shellfish poisoning caused by algal biotoxins, and for medical education on seafood-borne diseases and their symptoms, to ensure more comprehensive reporting.

Recommendations

Viruses in shellfish

1. WHO should organize a survey to provide more adequate information on viral contamination of shellfish (raw and depurated) and shellfish-growing areas in the Mediterranean region.

2. WHO should promote the urgently required development of rapid, simple and relatively inexpensive screening procedures for viruses in shellfish.
3. Within the framework of MED POL Phase II and through other appropriate programmes, WHO should give priority to studies of:
 - the use of surrogate indicators of viral contamination, particularly bacteriophages; and
 - the fate of human enteric viruses under marine environmental conditions and in virus removal procedures, particularly shellfish depuration.
4. WHO and public health authorities in Mediterranean countries should promote epidemiological studies on outbreaks of seafood-borne viral disease.
5. WHO reference laboratories for environmental virology should be designated.
6. Scientific collaboration between environmental virology laboratories in the Mediterranean region should be improved. This would enable institutions in the developing countries of the region to enhance their capability for virological monitoring and research, and allow the establishment of quality control in the different laboratories.
7. WHO should seek to ensure the implementation of the activities outlined in these recommendations so that guidelines for the monitoring of viral pathogens in shellfish can be developed.
8. Public health authorities in Mediterranean countries should provide the fullest possible support to the implementation of the activities outlined in these recommendations, including financial support as appropriate. This would accelerate the acquisition of data required for eventual measures to minimize human health risks from the consumption of virus-contaminated shellfish.

Algal biotoxins in shellfish

9. WHO should organize a thorough survey of the occurrence of toxic algae in the Mediterranean.
10. Within the framework of the MED POL programme and possibly that of other appropriate programmes, WHO should organize coordinated studies and projects to compare and improve the techniques for sampling and identifying toxigenic algal species. WHO should also organize comparative studies, using standardized methodology, to evaluate the occurrence and distribution of toxigenic algae in the Mediterranean region.
11. WHO should organize a coordinated survey of the methodology currently used to assess algal biotoxins in shellfish.
12. WHO should develop and promote standardized techniques to evaluate the relationship between species of toxigenic algae, their density in seawater and shellfish toxicity.
13. Within the framework of the MED POL programme, WHO should consider the promotion of collaborative studies to investigate the relationship between environmental parameters (such as eutrophication factors, bacterial flora, temperature and sunlight intensity) and shellfish toxicity.

14. In view of the inadequacy of current reporting on diseases attributable to the consumption of shellfish containing algal biotoxins, WHO, in cooperation with the public health authorities in Mediterranean countries, should improve training on the type and diagnosis of diseases resulting from shellfish toxicity. This would improve the recognition and reporting of such diseases by medical practitioners and public health services.

15. WHO and the public health authorities in Mediterranean countries should promote epidemiological studies to evaluate the impact on health of shellfish toxicity caused by toxin-producing microalgae.

16. WHO reference laboratories for algal biotoxins should be designated.