Interregional Workshop on Monitoring and Management Strategies for Benthic HABs

IAEA Technical Cooperation Projects RAS7026, RAF7014 and RLA7022
Supporting the Use of Receptor Binding Assay (RBA) to Reduce the Adverse Impacts of Harmful Algal Toxins on Seafood Safety

Oceanographic Museum of Monaco
09 to 12 April 2018

Within the activities of Monaco Ocean Week

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IAEA – Technical Cooperation Department
The IAEA at a Glance

• Founded in 1957
• 169 Member States- December 2017
• 2300 professional and support staff
• Headquarters in Vienna
• 2 scientific laboratories and research centres (Monaco and Seibersdorf)
Maximizing the contribution of nuclear technology to the world while verifying its peaceful use
Technical Cooperation Department

- **Mission:** Management and delivery of the technical cooperation programme for peace and development.

- **Strategy:** Promoting tangible socio-economic impact by contributing directly in a cost-effective manner to the achievement of the major Sustainable Development Goals.

- **Stakeholders:** Board of Governors, Member States, partner countries and organizations
TC Funding

- **Core Funding (TCF)** through MS Contributions

- **Extrabudgetary Funds (Footnote A/)** through MS Contributions, Donors, and other international organizations and NGOs

- This event was organised thanks to the USA PUI funds.

- **Governmental Cost-Sharing (GCS)** through MS Contributions of its own projects activities
The Technical Cooperation Programme

All Member States

Member States with TC projects
Full range of responsibilities including priority setting

Technical Departments
Scientific and technological support

Department of Technical Cooperation
Overall management and coordination
Support to programme planning

IAEA Secretariat

Technical Cooperation Programme
TC Programme: Key Aspects

- Evolving: new trends, challenges and emerging issues;
- Needs driven, Member State’s leadership and ownership;
- Peaceful use undertaking, safety and security;
- Programme management: a shared responsibility;
- Long term sustainability and self-reliance;
- Cooperation among Member States and with multilateral partners.

Secretariat, Member
Novel analytical methods, and innovative approaches

IAEA

RAS7026, RAF7014, RLA7022
The IAEA TC Programme is a mechanism for pooling in-house technical resources.

- Nuclear Power
- Nuclear Fuel Cycle & Waste
- Nuclear Safety
- Food & Agriculture
- Physical & Chemical Sciences
- Human Health
- Environment Studies & Monitoring
- Nuclear Security
- Radiation Transport Waste Safety

IAEA Technical Cooperation Programme

RAS7026, RAF7014, RLA7022
The Model Project Criteria

• respond to a **real need**;
• reflect an indispensable role for the **nuclear** technology involved;
• produce significant **economic or social impact**; and
• have demonstrated potential for **sustainability** through strong Government commitment.
Programme objectives: RAS7026, RAF7014 and RLA7022

- To build regional capacity for the management of ciguatera and other sodium channel toxins through:
  - **Risk assessment**
    Toxins characterization, species of fish, distribution of risk clinical data, epidemiology.
  - **Risk management**
    Detection methods for toxins, mutual recognition, regulations, availability of standards and CRMs, epidemiological data, traceability of food.
  - **Risk communication**
    Information to consumers and professionals, action protocols, species and areas at risk.
Short and midterm objectives

- Enhance the capacity of Member States to address Ciguatera Fish Poisoning (CFP) related issues;
- Impart knowledge regarding the protocols in environmental monitoring for CFP and standardization of the said protocols;
- Have trained personnel who could further disseminate the technique;
- Harmonization of the applied analytical method;
- Improve and harmonize the legal framework for monitoring;
- Improve mutual recognition of analytical reports and reduce technical barriers for trade;
- Improve food safety; and
- Reduce health hazard.
Interregional workshop in Monaco?

In order to manage Ciguatera it is crucial to understand on a regional basis the phenomenon and adapt potential monitoring programs and legislative decision to the regional circumstances.

In the same time, the study of Ciguatera requires technical, scientific and management approaches that has been and will have to be developed on a global basis.

In Monaco, 14 international experts were mobilized to contribute to this workshop.
Objective:

- To improve the skills of the participants in establishing environmental monitoring for benthic HABs and associated toxins for regulatory purposes; and
- To enhance the practical skills of the participants through lectures and group exercises.
Meeting Format and Objective (2)

- **Expected Workshop Outputs:**
  - Contribute for further *improvement of the design and structure of coastal monitoring programmes* including:
    - Methods used for *sampling and measuring* parameters;
    - Designing of *sampling scheme*;
    - Temporal and *spatial scales* of the biological and environmental factors; and
    - Data logging, storage and analysis.
Meeting Format and Objective (3)

- **Workshop format:**
  - Consultative and participative process and bidirectional input;
  - Day 1: Set of lectures by the experts and participants;
  - Day 2 and 3: Three parallel groups will be formed to rotate on the main subjects:
    - Benthic HAB monitoring strategy - Risk Assessment;
    - Marine resources monitoring;
    - Epidemiology and Risk Assessment;
    - Prepared to be used as a “Marketing document for fund raising”.
  - Day 3 afternoon: Compilation of worked out chapters.
The first regional coordination meeting of the IAEA Project RAS7026, was held in PNRI in June 2014
IAEA Workshop on Ciguatera Fish Poisoning (CFP) Field Monitoring, Institut Louis Malardé (ILM), Tahiti, French Polynesia, March 2015
One workshop is requested to address the RBA method validation / verification and the statistical approaches applied to data analysis and measurement results’ uncertainty estimation.

A second workshop is proposed to address HABs monitoring programs that will require analysis on the needs and strategies for such programmes for participating Member State.
Workshop/Meeting on RBA Methods Validation and Related Statistical Approaches, April 24 to 27, 2017, Manila, Philippines
Challenges

The RBA application for the evaluation of PSP toxins is already validated and accepted by AOAC, ISSC in the USA.

The RBA for ciguatera toxins is being implemented successfully in research and monitoring by specialized laboratories but its application to formal control is not yet accepted.

The challenges include incomplete validation data due to unavailability of commercial certified standards and reference materials.

Due to the numerous ciguatoxin analogs and to the complexity of fish matrices, efficient extraction procedures have difficulties to be harmonized into one single extraction method.
The way forward

Participating countries have monitoring programs at different stages of development.

Each country should identify the needs of coastal populations and economical activities from a social perspective in order to carefully define monitoring programs and optimize resources.

When defining monitoring strategies, each Member State should consider novel and cost-effective approaches, the use of volunteers for sampling, hazard identification/risk assessment and communication strategies such as media and smart phones applications.
The way forward

Research on Ciguatera and technological development are steadily advancing, and safety guidance levels have been proposed. However, strategic tools are still to be achieved:

Certified reference standards, CRMs, formally validated methodology and confirmatory methodologies, toxin profiles in samples, toxicology data on CTXs derivatives, and more.

Based on above, limitations of RBA should be recognized, the technique should not be promoted unless valid and reliable conclusion is reached.
Acknowledgement

Special thanks to:
Ms Anne Vissio, RAMOGE Executive secretary;
Mr Oksfeldt Enevoldsen Henrik, UNESCO, IOC
Mr Lemée Rodolphe, Université Pierre et Marie Curie – CNRS
Ms Natalie Anrich, ANSES - French Agency for Food & Environment
Mr Philipp Hess, IFREMER, Laboratoire Phycotoxines
Ms Clemence Mahana Iti Gatti, Institut Louis Malarde
Ms Garrido Gamarro Esther, FAO
Ms Tritscher Angelika, WHO
Mr Rodolphe Lemée, Sorbonne Univ.
Ms Tester Patricia, NOAA
Mr Steven R Kibler, NOAA
Mr Parsons Michael Lewis, Florida Gulf Coast University
Mr Simon Tabbada, PNRA

And to all participants
IAEA Technical cooperation: delivering results for peace and development

Thank you for your attention