

Chemical and Drug Residues in Fish and Fish Products in Southeast Asia (Biotoxins Monitoring in ASEAN)

by Marine Fisheries Research Department (MFRD)

From 2009 to 2012, the Post-harvest Technology Division has been conducting the Japanese Trust Fund II project on Chemical and Drug Residues in Fish and Fish Products in Southeast Asia- Biotoxins Monitoring in ASEAN under Marine Fisheries Research Department (MFRD) programmes.

Consumption of a variety of shellfish and fish that harbor potential marine biotoxins causes an increasing number of human intoxications around the world. Around 400 poisonous fish species exist and, by definition, the substances responsible for the toxicity of these species are biotoxins. Marine biotoxins represent a significant and expanding threat to human health in many parts of the world. The impact is visible in terms of human poisoning or even death following the consumption of contaminated shellfish or fish, as well as mass killings of fish and shellfish, and the death of marine animals and birds.



Opening ceremony of the program on Chemical and Drug Residues in Fish and Fish Products in Southeast Asia

The Codex Alimentarius Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) defined biotoxins as poisonous substances naturally present in fish and fishery products or accumulated by the animals feeding on toxin producing algae, or in water containing toxins produced by such organisms.

Monitoring seafood for toxicity is essential to manage the risks. However, there are several limitations in monitoring for toxicity such as the variation in toxin contents between individual shellfish, different detection and even extraction methods for the various toxins requiring a decision which toxins should be test for, and the frequency of sampling to ensure that toxicity does not rise to dangerous levels in temporal or spatial gap between sampling times or locations. Furthermore, the growing harvest of non-traditional shellfish (such as moon snails, whelks, barnacles) may increase human health problems and management responsibilities (FAO, 2004).

In view of these, a project on biotoxins monitoring in ASEAN Countries was proposed by SEAFDEC/MFRD to increase the attention in expanding and improving initiatives to monitor, detect and share information on marine biotoxins in order to reduce the public health risks associated with the consumption of contaminated shellfish and fish.

The objectives of the project are to:

- (i) Establish protocols for harmonization;
- (ii) Encourage member countries without monitoring system to establish their own system;
- (iii) Establish a directory of reference of experts and responsible persons; and
- (iv) Enhance analysis capability to an acceptable confidence level with the 1-year survey.

Regional Technical Consultation

The First Regional Technical Consultation for the project was held from 26-28 August 2009 at Novotel Clarke Quay in Singapore.

A total of 19 participants from SEAFDEC member countries attended the meeting. Japanese expert, Dr. Toshiyuki Suzuki from the National Research Institute of Fisheries Science, the expert for the project was also present at the meeting.

Representatives from each country presented the biotoxins monitoring situation in their respective countries and their future plans. Dr. Suzuki also shared a paper on 'Biotoxin

Monitoring System – A Japanese Experience’. The Meeting agreed that there is an urgent need to build up capability in member countries for biotoxins analysis and that the methods should be rapid and preferable using equipment such as High Performance Liquid Chromatography (HPLC) or HPLC Tandem Mass Spectrometer (LC/MS/MS). The meeting also identified and agreed on the types of biotoxins and species to be monitored for the survey.



Japanese expert, Dr.Toshiyuki Suzuki from National Research Institute of Fisheries Science demonstrated on biotoxin monitoring during the RTC

Regional Training Course

The Regional Training Course, which was coordinated by the PHTD (Post-harvest Technology Division) was held at the Toxins Laboratory in the Veterinary Public Health Centre from 28 June to 7 July 2010, with the objective of training the member countries in establishing the biotoxins monitoring system in their respective countries.

Twenty-two participants from 10 ASEAN-SEAFDEC Member Countries participated in the training course. Dr. Toshiyuki Suzuki and Dr. Ryuichi Watanabe from the National Research Institute of Fisheries Science, Japan and Dr. Yasukatsu Oshima from Kitasato University were the lead trainers of the program. Two trainers each were also invited, through the Oasis Solutions Pte Ltd and Tropical Technology Centre, Japan, to conduct the sessions for rapid methods.

The 5 methods covered were:

- 1) DSP and lipophilic toxins analysis using LC/MS/MS
- 2) PSP toxins analysis using HPLC

- 3) TTX toxins using LC/MS/MS
- 4) PSP ELISA rapid method
- 5) DSP rapid method.

These methods were selected based on feedbacks from member countries on the methods they wish to build up capability in during the regional technical consultation in 2009.



Survey

Following the Regional Training Course on Biotoxins Analysis, the member countries are expected to conduct a national biotoxins survey over a period of one year at selected sites. The use of methods taught in the training course is encouraged.

Results from the survey will be published as a technical compilation in 2012. An End-of-Activity meeting will also be held in 2012 to share the results of the survey, progress of biotoxins monitoring situation in respective countries and do a review of the project.



The Regional Training Course held at the Toxins Laboratory in Veterinary Public Health Centre

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