

MYANMAR

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I. Introduction

For the previous year, no biotoxins monitoring system and procedures were carried out in Myanmar. Most of the species of shellfish are distributed in the coastal region area and people who consume shellfish are usually located in these coastal regions. However, majority of the people in Myanmar do not prefer to eat shellfish. There is no history and evidence of any biotoxin incidents or outbreaks in Myanmar as there were no monitoring practice and surveillance programme for biotoxins. The country's Department of Fisheries (DoF) just started participating in the "Biotoxins Monitoring in ASEAN" programme in year 2009, under the Japanese Trust Fund II (JTF II) Project on Chemical and Drug Residues in Fish and Fish Products in Southeast Asia, led by the Marine Fisheries Research Department (MFRD), Southeast Asian Fisheries Development Center (SEAFDEC).

Under this programme, a survey was conducted and the monitoring period was classified into two quarters, with the first quarter from January to June 2011 and the second quarter from July to December 2011. Toxins such as Saxitoxin for Paralytic Shellfish Poisoning (PSP), Okadaic Acid for Diarrhetic Shellfish Poisoning (DSP) and Domoic Acid for Amnesic Shellfish Poisoning (ASP) in mussels and hard clams are being monitored. The monitoring areas were Kawthaung District and Tanintharyi Region which were located in the Southern parts of

Myanmar. Samples were collected at least one month before analysis by DoF officers in the Tanintharyi region.

II. Objectives and Goals

The objectives are to

- increase the knowledge about biotoxins
- raise awareness to the people in Myanmar
- protect the consumers in the event of any biotoxins outbreak
- practice and control biotoxin outbreaks by surveillance and monitoring programme
- train skilful personnel to assist laboratory staffs to carry out biotoxins analysis
- ensure uniformity and compliance with the standards of biotoxins monitoring in all member states.

III. Survey Methodologies

a. Sampling Method, Sampling Site, Target Species, Number of Samples & Sampling Size

The sampling sites were Kawthaung District and Tanintharyi Region, which were located in the southern parts of Myanmar, along the coastal region areas. The targeted species for biotoxins monitoring are Green Mussels (*Perna viridis*) and Hard Clam (*Metretrix casta*). 10 samples were collected for duplicate determination.

Samples were collected directly from sampling

sites and put into insulated boxes. These samples were kept in chilled conditions, where temperatures were controlled between 0 to 4oC and then sent to the analytical laboratory in Yangon by air.

b. Method of Analysis

The testing procedures of ABRAXIS chemical test kit from Netherlands was used for sample preparation and the ELISA method was used for analysis. Quality control measures were achieved by ensuring that:

- every batch of analysed samples used the standard series for calibration curve,
- each sample went through duplicate analysis,
- spiked sample was used for percentage recovery,
- zero standard was used for OD,
- acceptance criteria for co-efficient, r, must be ≥ 0.98 ,
- duplicate analysis (with separate extraction) was done for every 10% sample and
- percentage of RPD must be ≤ 30 .

c. Limit of Detection & Limit of Quantification

	<u>1st Quarter</u>	<u>Limit of Detection (LOD)</u>	<u>Limit of Quantification (LOQ)</u>
PSP {	(G.M)	0.948683 μ g/100g	3.1622776 μ g/100 g
	(H.C)	1.4491376 μ g/100g	4.8304589 μ g/100g
DSP {	(G.M)	0.9486832 μ g/100g	3.1622776 μ g/100g
	(H.C)	1.264911 μ g/100g	4.2163702 μ g/100g
ASP {	(G.M)	5.0596442 μ g/100g	16.8654808 μ g/100g
	(H.C)	6.32455 μ g/100g	21.081851 μ g/100g

	<u>2nd Quarter</u>	<u>Limit of Detection (LOD)</u>	<u>Limit of Quantification (LOQ)</u>
PSP {	(G.M)	1.2649110µg/100g	4.2163702µg/100g
	(H.C)	1.5811388µg/100g	5.2704628µg/100g
DSP {	(G.M)	1.4491377µg/100g	4.8304590 µg/100g
	(H.C)	1.5491933µg/100g	5.1639778µg/100g
ASP {	(G.M)	4.4271887µg/100g	14.7572958µg/100g
	(H.C)	6.9570109µg/100g	23.1900362µg/100g

d. National Regulatory Limits

There are no established national regulatory limits for PSP, DSP and ASP in Myanmar yet. Myanmar DoF complies with European Union (EU) Standard and other importing countries requirements.

The maximum tolerance levels established by the EU and their criteria are as follows:

- PSP: 40 - 80µg/100g edible
- DSP: 16µg/100g
- ASP: 2000µg/100g

IV. Results and Discussions

a. Participation in Inter-Laboratory Proficiency Testing & Results

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b. Survey Results & Discussion

Sampling Location	Month & Year of Sampling (MM/YYYY)	Analyte Tested	No. of Samples Analysed	Minimum Concentration (ug/100g of meat)	Maximum Concentration (ug/100g of meat)	Average Concentration (ug/100g of meat)
Kawthaung Tanintharyi Region	January – June 2011	PSP	GM 10	0	1	0.9
			HC 10	0	1	0.3
		DSP	GM 10	0	1	0.1
			HC 10	0	1	0.2
		ASP	GM 10	0	6.0	3.2
			HC 10	2	6.0	4.0
	July – December 2011	PSP	GM 10	0	1	0.8
			HC 10	0	1	0.5
		DSP	GM 10	0	1	0.3
			HC 10	0	1	0.4
		ASP	GM 10	2	6.0	4.2
					0	6.0

Table MYI: Survey results

All the test results including the 1st and 2nd half of Biotoxins Survey concluded that each average concentration of PSP, DSP and ASP was less than EU limits. Furthermore, all test results could be concluded as “Not Detected (ND)” because the average concentration for PSP, DSP and ASP are less than the LOD.

c. Corrective Actions

Corrective actions required were:

- verification of the analysis method
- participation in the Proficiency Testing programme
- verification of sampling method

V. Problems and Challenges Encountered

Problems and challenges encountered included:

- Insufficient project funding for overall survey charges. At present, only ELISA method was used for biotoxins survey in place of High Performance Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) as the latter method is more expensive than the ELISA method. Thus LC/MS/MS method is not used.
- Sampling problems.
- Transportation problems.

VI. Recommendations and Suggestions for Future Follow-Up Action

This project should be conducted annually and future trainings that were to be conducted could be structured to allow better understanding on biotoxins analysis as well as the principles and procedures of biotoxins monitoring system. There should be more manpower to carry out the future trainings to maximise the laboratory's capability in biotoxins testing. Further investigations to be carried out on aquatic fish species such as Grouper, Spanish mackerel and John's snapper to detect other potentially toxic substances such as Ciguatera Fish Poisoning (CFP). It is recommended to set up a new ASEAN reference laboratory which focuses on Biotoxin analysis in the ASEAN region. It is also recommended for all ASEAN member countries to be contacted with only one Biotoxins Proficiency testing service provider.