UN23: Accelerating capacity development transformation in the Western Pacific – Regional Network of Training and Research Centers (RTRCs) on Marine Science

REGIONAL TRAINING AND RESEARCH CENTER ON MARINE TOXINS AND SEAFOOD SAFETY (RTRC-MTSS)

Dao Viet Ha
Assoc. Prof., Director of Institute of Oceanography, VAST, Viet Nam

Presentation Outline

01 | Introduction

02 | Objectives

03 | Actions

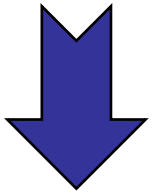
04 | Expected outputs/outcomes

05 | Coming activities

CHALENCES

- Expanding of seafood poisonings in the region, incl. unknown/new toxins;
- Almost of all member states have not enough capacity and human resource to identify causative toxins (excepted Japan and Vietnam)

To address need from WESTPAC member states for high quality trainings in order to train experts in marine toxins and seafood safety research, regionally and nationally



RTRC-MTSS IN VIETNAM

OBJECTIVES

1) To enhance the capacity of developing countries, particularly in the region for marine toxin detection, identification and analysis, through the development and operation of professional trainings and expertise exchanges;
2) To promote cooperation and conduct joint studies on marine toxin research and seafood safety among WESTPAC scientists, institutions and countries;
3) To create regional networking.

Acts/ Activities

- Standadizing protocol(s) for marine biotoxins' detection and analysis
- Co-conducting field research using developed protocols;
- Providing/Sharing working environment by taking RTRC on Marine biotoxins (if requested) and Supporting in identification of causative marine biotoxins (if requested);

Output s/ out comes

- Practical protocol(s) for new/unknown toxins identification;
- Regional capacitdinatingine biotoxins' research is strenthen (co-research, TC-WS..);
- Better understanding on marine toxins' occurrence and their effected in the region (reports/publications..)

DEVELOPMENT OF REGIONAL TRAINING AND RESEARCH CENTER ON MARINE TOXINS AND SEAFOOD SAFETY (RTRC-MTSS)

- **STARTED DATE:** 1 May, 2019
- **DURATION:** 05 years (2019-2023)
- **HOST:** Institute of Oceanography (IO); Dr. Dao Viet Ha
- **PARTNERS:**
- *National Research Institute of Fisheries Science (NRIFS), Japan*
- *City University of Hong Kong*
- *University of Malaya, Malaysia*
- *The University of Tokyo, Japan*
- *Korea Institute of Science and Technology, Korea*
- **TOTAL BUDGET (US$):** Est. 2,0 mils. US$
- *VAST: est. 1,85 mils. US$;*
- *Other extrabudgetary sources: 150,000 US$*

TYPE OF ACTIVITY

- Short-term training [x]
- International workshops, seminars... [x]
- Joint Research [x]
- Visiting professorships [x]
- Institutional development [x]

TARGET BENEFICIARIES

- Students [x]
- Academics [x]
- Technical officers [x]

EXPECTED OUTPUTS

Research protocols jointly developed on the study and chemical analysis of specific marine toxins (Tetrodotoxins, Amnesic Shellfish toxin, Saxitoxins, Ciguatoxins…) which are hot issues related to seafood safety in the region;

Assessment and enhanced knowledge on toxin distribution and their contamination in the region (scientific publications);

Regional network strengthened on marine toxin research and seafood safety to exchange/update information on marine toxins and seafood safety.

ACCELERATING MARINE TECHNOLOGY FOR SEAFOOD SAFETY IN VIETNAM

- MTSS- RTRC: Trainings workshops









ACCELERATING MARINE TECHNOLOGY FOR SEAFOOD SAFETY IN VIETNAM

- MTSS- RTRC: Evaluation: Sept. 2023







DEVELOPMENT OF REGIONAL TRAINING AND RESEARCH CENTER ON MARINE TOXINS AND SEAFOOD SAFETY (RTRC-MTSS)

Fisheries Science (2020) 86:181–186
https://doi.org/10.1007/s12562-019-01375-3

ORIGINAL ARTICLE

Food Science and Technology

Occurrence of tetrodotoxin in three *Nassarius* gastropod species in Khanh Hoa Province, Vietnam

Ha Viet Dao[1] · Ky Xuan Pham[1] · Ben Xuan Hoang[1] · Masato Tanioka[2] · Ryuichi Watanabe[3] · Toshiyuki Suzuki[3]

Received: 5 August 2019 / Accepted: 10 October 2019 / Published online: 12 November 2019
© Japanese Society of Fisheries Science 2019

Abstract
Neurotoxic poisonings with fatal symptoms caused by consumption of *Nassarius* gastropods have been reported in Vietnam but the causative toxins have not been confirmed. In the present study, *Nassarius conoidalis*, *N. glans* and *N. pullus,* which are considered to be common causative species, were collected in Khanh Hoa province, Vietnam in May 2016 for toxin analysis using LC/MS/MS. The results confirmed that TTX is a dominant toxin in these gastropods. Among them, *N. glans* exhibited the highest toxicity (412.7 ± 107.3 MU/g), followed by *N. conoidalis* (144.8 ± 82.0 MU/g) and *N. pullus* (19.6 ± 9.8 MU/g). This is the first report confirming TTX in these species. All specimens in this study were hightly toxic, indicating that the frequency of toxic specimens of the three *Nassarius* species is extremely high. Further, their toxicities were all beyond the

Fisheries Science
https://doi.org/10.1007/s12562-022-01638-6

ORIGINAL ARTICLE

Food science and Technology

Ciguatoxin in moray eels raising the risk for seafood safety in Viet Nam

Ha Viet Dao[1,2] · Hy Ho Khanh Le[1] · Thao Thi Thu Le[1] · Ky Xuan Pham[1] · Minh Quang Bui[3] · Leo Lai Chan[4]

Received: 31 May 2022 / Accepted: 31 August 2022
© The Author(s), under exclusive licence to Japanese Society of Fisheries Science 2022

Abstract
Recently, suspected ciguatera fish poisoning (CFP) cases caused by the consumption of moray eels, popular seafood for locals and tourists, have been reported in Viet Nam. However, little is known about ciguatoxins (CTXs) in these marine fish. In May 2020, 119 specimens of six moray eel species were collected for CTX detection from Ly Son Island (site 1), Ninh Hai Coast (site 2), Phu Quy Island (site 3), and Spratly Islands (site 4), where suspected CFP from moray eel consumption have occurred. CTX-1B was detected by liquid chromatography–mass spectrometry (LC/MS) analysis in 12 specimens belonging to four *Gymnothorax* species: (*G. fimbriatus*, *G. flavimarginatus*, *G. javanicus*, and *G. undulatus*), accounting for about 10% of the total specimens. Remarkably, CTX-1B levels detected in all toxic specimens were beyond the safety threshold of 10 pg/g CTX-1B equivalent. The highest occurrence was observed at site 4 (15.6%) ($n = 45$), followed by site 1 (10.0%) ($n = 40$) and site 2 (6.3%) ($n = 16$); whereas no CTX-1B was detected in any specimens ($n = 18$) from site 3. These results,

toxins

an Open Access Journal by MDPI

Identification of Fish Species and Toxins Implicated in a Snapper Food Poisoning Event in Sabah, Malaysia, 2017

Ha Viet Dao; Aya Uesugi; Hajime Uchida; Ryuichi Watanabe; Ryoji Matsushima; Zhen Fei Lim; Steffiana J. Jipanin; Ky Xuan Pham; Minh-Thu Phan; Chui Pin Leaw; Po Teen Lim; Toshiyuki Suzuki

Toxins **2021**, Volume 13, Issue 9, 657

Funding by IOC, VN: 03 SCI papers (01 Q1, 02 Q2) (2020, 2021, 2022), 01 (Q3) 2023.

ACCELERATING MARINE TECHNOLOGY FOR SEAFOOD SAFETY IN VIETNAM

RECENT AND ON-GOING STUDY OF MARINE TOXINS

- Identification of toxins in abundant marine species in Vietnamese waters (2024 – 2026)
- Development of standard protocols for the identification of toxins in some marine species in Vietnamese waters» (2021 – 2023)
- Identification of species causing seafood poisoning in Viet Nam based on DNA análisis (2019-2023)
- Study of toxins in reef fish and mollusc species in Viet Nam which have potential risk of causing poisoning (2021 – 2023)
- Study of harmful substances created during the preservation of marine foods (2021 – 2023)
- The correlation between environmental toxins and toxic accumulation in marine foods (2021 – 2023)

ACCELERATING MARINE TECHNOLOGY FOR SEAFOOD SAFETY IN VIETNAM

ACTIVITIES 2024-2026

- Co-conducting field research using developed protocols;

- Providing/sharing working environment by taking RTRC on Marine biotoxins (if requested) and Supporting in identification of causative marine biotoxins (if requested).

ACCELERATING MARINE TECHNOLOGY FOR SEAFOOD SAFETY IN VIETNAM

- Est. budget: 400 K USD from VN goverment
- Activities: Seminars, TC-WS, expert exchange, case studies (sampling, analysis…);

OUTPUTS/OUTCOMES

- Regional capacity in biotoxins' research is strengthen (co-research, TC-WS…);
- Better understanding on marine toxins' occurrence and their effected in the region (reports/publications…).

DEVELOPMENT OF REGIONAL TRAINING AND RESEARCH CENTER ON MARINE TOXINS AND SEAFOOD SAFETY (RTRC-MTSS)

Year	Proposed activities	Specific objectives	Expected Outputs	Expected Outcomes
2023/2024	TC "Applying molecular technique for toxic species identification"	To strengthen capacity for Marine toxin research	A practical protocol of the quantitate analysis for toxic organisms; 3-4 key persons in molecular analysis	Capacity on identification of toxic organisms in the region is enhanced
2024/2025	Co-field research on "Sampling and reservation method to analyse ciguatoxin"	To strengthen capacity on scientific sampling toxic benthic organisms	A pratical protocol for scientific sampling of toxic benthic organsisms; 5-10 trained persons who can take sampling in efficient way	Scientific sampling skill for toxic benthic organisms is improved
2023	Expert sending for "Appropriate method to analyse CTX by LCMS in IO"	To strengthen capacity on toxin analysis	A pratical protocol for CTX analysis; 10 trained persons who can work on culture experiment	Scientific method for toxin study is improved
2024	Evaluation of RTRC	Providing/sharing working condition marine toxins and seafood safety	Regional serving on TTX, STX and CTX analysis and research	Recognized RTRC

YOU ARE WELCOME TO JOIN!



