

**MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
NATIONAL AGRO-FORESTRY-FISHERIES QUALITY ASSURANCE
DEPARTMENT (NAFIQAD)**

REPORT
Sanitation Monitoring Program
for Bivalve Mollusc Production Areas in 2019
and
Plan for Program implementation in 2020

Hanoi, March 2020

PART I
RESULTS OF THE SANITATION MONITORING PROGRAM FOR BIVALVE
MOLLUSC PRODUCTION AREAS IN 2019

1. Scope and species under the Program:

1.1. Species:

- Baby clam (*Meretrix lyrata*);
- Yellow clam (*Paphia undulata*);
- Antique ark (*Anadara antiquata*);
- Scallop (*Chlamys nobilis*).

1.2. Scope: In 2019, the Program was carried out at 13 bivalve mollusc (BM) production areas located in 08 following provinces/cities: Thai Binh, Nam Dinh, Ho Chi Minh City, Tien Giang, Ben Tre, Tra Vinh, Kien Giang and Binh Thuan (details in Table 1).

Table 1: Production areas, species under the Program in 2019

No.	Production areas and approval number	Province	Species
1.	Tien Hai (TH)	Thai Binh	Baby clam (<i>Meretrix lyrata</i>)
2.	Giao Thuy (GT)	Nam Dinh	Baby clam (<i>Meretrix lyrata</i>)
3.	Nghia Hung (NH)		Baby clam (<i>Meretrix lyrata</i>)
4.	Binh Dai (BD)	Ben Tre	Baby clam (<i>Meretrix lyrata</i>)
5.	Ba Tri (BT)		Baby clam (<i>Meretrix lyrata</i>)
6.	Thanh Phu (TP)		Baby clam (<i>Meretrix lyrata</i>)
7.	Tan Thanh (GC)	Tien Giang	Baby clam (<i>Meretrix lyrata</i>)
8.	Can Gio (CG)	Ho Chi Minh	Baby clam (<i>Meretrix lyrata</i>)
9.	Tuy Phong (TU) ^(*)	Binh Thuan	Scallop (<i>Chlamys nobilis</i>)
			Antique ark (<i>Anadara antiquata</i>)
10.	Ham Tan (HA) ^(*)		Antique ark (<i>Anadara antiquata</i>)
11.	Phan Thiet (PT) ^(*)		Antique ark (<i>Anadara antiquata</i>)
			Scallop (<i>Chlamys nobilis</i>)
12.	Duyen Hai (DH)	Tra Vinh	Baby clam (<i>Meretrix lyrata</i>)
13.	Ba Lua (BL)	Kien Giang	Yellow clam (<i>Paphia undulata</i>)

Note: ()*: These areas are not allowed to harvest for processing to export to the EU because of non-compliance with EU's regulation on Cadmium residues.

2. Program implementation results

2.1. Sampling results:

Sampling results are shown in Table 2.

Table 2. Sampling results

No.	Production area	Number of sampling point(s)	Number of samples (plan)		Number of samples (actual)		Remark
			BM samples	Water samples	BM samples	Water samples	
1.	Tien Hai	1	27	54	27	54	
2.	Giao Thuy	1	27	54	27	54	
3.	Nghia Hung	1	27	54	27	54	
4.	Tan Thanh	1	25	50	25	50	
5.	Binh Dai	2	50	100	60	120	05 intensive sampling (10 BM sample and 20 water samples) in which 03 intensive sampling due to <i>Pseudo-nitzschia spp</i> level exceeding the warning limit and 02 intensive sampling due to <i>Dinophysis caudata</i> level exceeding the warning limit
6.	Ba Tri	1	25	50	25	50	
7.	Thanh Phu	1	25	50	25	50	
8.	Can Gio	1	25	50	27	54	02 intensive sampling (2 BM sample and 4 water samples) due to <i>Pseudo-nitzschia spp</i> level exceeding the warning limit
9.	Tuy Phong	2	6	-	6	-	These areas are not allowed to harvest for processing to export to the EU because of non-compliance with EU's regulation on Cadmium residues.
10.	Phan Thiet	2	6	-	6	-	
11.	Ham Tan	1	3	-	3	-	
12.	Duyen Hai	1	22	44	22	44	
13.	Ba Lua	1	25	50	25	50	
	Total				305	580	

2.2. The testing results

Summary of the testing results of samples taken from BM production areas in 2019 is shown in Table 3.

Table 3. Testing results

No	Parameter	Number of samples analyzed	Detected production areas	Non-compliant samples
1	Toxin-producing plankton (cell/litre)			
	<i>Alexandrium spp</i>	556		0
	<i>Gymnodinium catenatum</i>	556		0
	<i>Dinophysis acuminata</i>	556		0

No	Parameter	Number of samples analyzed	Detected production areas	Non-compliant samples
	<i>Dinophysis caudata</i>	560 ^(*)	<i>Dinophysis caudata</i> was detected at Ba Lua, Binh Dai, Tien Hai. In which, 02 samples at Binh Dai area were detected at level exceeding the warning limit (01 sample: 19.000 cell/liter and 01 sample: 17.000 cell/liter).	02 (Binh Dai)
	<i>Prorocentrum lima</i>	556		0
	<i>Protoceratium spp.</i>	556		0
	<i>Pseudonitzschia spp.</i>	576 ^(**)	<i>Pseudonitzschia spp.</i> was detected at Tien Hai, Giao Thuy, Nghia Hung, Tan Thanh, Binh Dai, Ba Tri, Can Gio, Ba Lua areas. In which, 03 samples at Binh Dai (01 sample: 110.000 cell/liter, 01 sample: 577.000 cell/liter and 01 sample: 1.675.000 cell/liter), 01 sample at Can Gio (191.000 cell/liter) were detected at level exceeding the warning limit	04 (Binh Dai, Can Gio)
2	Biotoxin			
	PSP	278		0
	Lipophilic	280 ^(*)		0
	ASP	288 ^(**)		0
3	Microorganisms			
	<i>E. coli</i> (MPN/100g)	126 ^(**)	all production areas.	0
	<i>Salmonella</i> /25g	18 ^(***)		0
	<i>Norovirus</i>	18 ^(***)		0
4	Heavy metals			
	Pb	22	all production areas.	0
	Hg	22	Hg was detected at Giao Thuy, Duyen Hai, Ba Lua areas	0
	Cd	37	- all production areas. - 15 scallop samples (in Tuy Phong, Phan Thiet, Ham Tan areas) and antique ark samples (in Tuy Phong, Phan Thiet areas) were detected at level exceeding the EU regulatory limit (1.0 mg/kg), in which, 06 antique ark samples exceeded the Vietnamese regulatory limit (2.0 mg/kg).	06 samples exceeded Vietnam's MRL; 15 samples exceeded EU's MRL
5	Organo-chlorinated pesticides			
	Aldrin	22		0
	Dieldrin	22		0
	Endrin	22		0
	Heptachlor	22		0
	DDT	22		0
	Chlordane	22		0

No	Parameter	Number of samples analyzed	Detected production areas	Non-compliant samples
	BHC	22		0
	Lindane	22		0
6	Contaminants			
	Dioxin (mg/kg)	11		0
	PCBs (mg/kg)	11		0
	PAHs (mg/kg)	11		0

Note:

(*): analysis of 02 intensive samplings due to *Dinophysis caudata* exceeding the limit

(**): analysis of 04 intensive samplings due to *Pseudo-nitzschia spp.* exceeding the limit

(***): One sampling/month in 8 areas (in Tien Hai, Giao Thuy, Nghia Hung, Can Gio, Tan Thanh, Binh Dai, Ba Tri, Thanh Phu), 11 samplings/12 months in Duyen Hai area (due to bivalve molluscs not available for 1 sampling), 7 samplings/7 months in Ba Lua area (due to resource protection)

(****): 11 samplings/12 months in Duyen Hai area (due to bivalve molluscs not available for 1 sampling), 7 samplings/7 months in Ba Lua area (due to resource protection).

2.2.1. Evaluating the test results of toxin-producing plankton and biotoxins:

- *Alexandrium spp.*, *Gymnodinium catenatum*, *Dinophysis acuminata*, *Prorocentrum lima*, *Protoceratium spp.* were not detected in any analysis.

- *Pseudo-nitzschia spp.* was detected in water samples taken from 08 production areas (Tien Hai, Giao Thuy, Nghia Hung, Tan Thanh, Binh Dai, Ba Tri, Can Gio, Ba Lua) with the detection percentage of 7.11% (41 samples detected/ 576 samples analyzed). In which, 03 water samples in Binh Dai area (in Ben Tre province) and 01 water sample in Can Gio area (in Ho Chi Minh city) were detected at the level exceeding the warning limit (100.000 cells/litre) (increasing compared to 2018 - no sample exceeding the warning limit).

- *Dinophysis caudata* was detected in water samples taken from 3 production areas (Ba Lua, Binh Dai, Tien Hai) with detection percentage of 0.9% (5/560 analysis). In which, 02 water samples were detected at the level exceeding the warning limit (500 cells/litre) in Binh Dai area (in Ben Tre province) (similar to monitoring results in 2018).

Results of analysis of biotoxins showed that although water samples were detected with *Pseudo-nitzschia spp.*, *Dinophysis caudata* at level exceeding the warning limit, PSP, Lipophilic, ASP biotoxins were not detected in all of the bivalve molluscs samples. Therefore, it could be concluded that Vietnam's bivalve products have not been high risk with biotoxins (similar to previous years).

2.2.2 Evaluating the test results of microorganisms:

a. Testing results of *E. coli* in flesh and intra-valvular liquid:

Among total 126 analyzed BM samples, no samples found with *E. coli* higher than 46,000 MPN/100g, 01 samples were detected with *E.coli* ranging from 4,600 to 46,000 MPN/100g (in Nghia Hung production area). All remaining samples were found with *E.coli* levels less than 4,600 MPN/100g.

b. Testing results of *Salmonella* and *Norovirus*: *Salmonella* and *Norovirus* were not detected in all of 18 BM samples which were taken from Duyen Hai and Ba Lua areas (Class “A” areas).

Therefore, it is considered that there is no unusual phenomenon of microbial contamination in production areas of Vietnam in 2019.

2.2.3 Evaluating the test results of Chemical contaminants

- Lead (Pb): 22/22 BM samples were found with Pb at the detection levels ranging from 0.044 to 0.476 mg/kg, lower than regulatory limit (1.5mg/kg).
- Mercury (Hg): 3 BM samples were found with Hg in Giao Thuy, Duyen Hai, Ba Lua areas at the detection levels ranging from 0.006 to 0.0316 mg/kg, lower than regulatory limit (0.5mg/kg).
- Cadmium (Cd): Cd was detected in almost analyzed samples (35/37 samples) taken from all production areas at detection levels from 0.1 to 3.43 mg/kg (similar 2018). In which, 15 scallop samples and antique ark samples (in Tuy Phong, Phan Thiet and Ham Tan areas of Binh Thuan province) were found Cd levels exceeding the EU regulatory limit (1.0 mg/kg), 06 scallop samples were found Cd levels exceeding the Vietnamese regulatory limit (2.0 mg/kg).
- Organochlorinated pesticides were not found in all of 22 BM samples in all production areas.
- Other contaminants (Dioxin, PCBs, PAH) were not found in all of 11 BM samples in all production areas.

The results of chemical contaminants analysis in 2019 showed that, there is no abnormal phenomena or sources of heavy metal and pesticides in all production areas. In which, 3 production areas in Binh Thuan provinces are still not allowed to harvest for processing to export to the EU because of non-compliance with EU's regulation on Cadmium residues.

2.3. Handling of testing results, delivery of Warning Notice:

In case of unsatisfactory testing results, inspecting body delivered warning notice in compliance with the Circular No. 33/2015/TT-BNNPTNT dated 08th October 2015 of the Ministry of Agriculture and Rural Development and the guidance described in the Manual of Sanitation Monitoring Program for BM Production areas (BM Manual) promulgated by Decision No. 400/QĐ-QLCL dated 07th September 2015 of NAFIQAD; inspecting body also requested local competent authorities to take intensive samples according to these regulations. In details:

- In case of *Dinophysis caudata* (in Binh Dai area) and *Pseudo-nitzschia spp.* (in Binh Dai, Can Gio areas) at level exceeding the warning limits, the inspecting body already issued warning notice and requested local competent authorities to take intensive samples from this above area; besides, all batches of BM harvested from previous sampling must be undergone biotoxin testing prior to being placed on the market. Following satisfactory testing results of 2 consecutive samplings, the inspecting body communicated the removal warning.
- Scallop and antique arks from Tuy Phong, Phan Thiet and Ham Tan areas (Binh Thuan province) were not allowed to be harvested for processing and export to the EU; these 02 BM species are under intensive monitoring for Cadmium once every 4 month in compliance with Circular 33/2015/TT-BNNPTNT.

2.4. Classification of production areas

Based on *E. Coli* testing results from 2017 to 2019, production areas have been classified as of A (2 areas), B (5 areas) and C (3 areas); details in Table 4.

Table 4: Classification of production areas

No	Production area	Species	Total number of <i>E.coli</i> analysed samples from 2017-2019	Number of samples detected with <i>E.coli</i> (MPN/100g) from 2017-2019					Classification of production area
				≤230	From above 230 to 700	From above 700 to 4600	From above 4.600 to 46.000	>46.000	
1.	Tien Hai	Baby clam (<i>Meretrix lyrata</i>)	39	3 (7.7%)	14 (35.9%)	19 (48.7%)	2 (5.1%)	1 (2.6%)	C
2.	Giao Thuy	Baby clam (<i>Meretrix lyrata</i>)	36	2 (5.5%)	15 (41.7%)	15 (41.7%)	4 (11.1%)	0	C
3.	Nghia Hung	Baby clam (<i>Meretrix lyrata</i>)	36	2 (5.5%)	9 (25%)	19 (52.8%)	6 (16.7%)	0	C
4.	Binh Dai	Baby clam (<i>Meretrix lyrata</i>)	36	24 (66.7%)	4 (11.1%)	8 (22.2%)	0		B
5.	Ba Tri	Baby clam (<i>Meretrix lyrata</i>)	36	22 (61.1%)	3 (8.3%)	11 (30.6%)	0		B
6.	Thanh Phu	Baby clam (<i>Meretrix lyrata</i>)	36	22 (61.1%)	6 (16.7%)	8 (22.2%)	0		B
7.	Tan Thanh	Baby clam (<i>Meretrix lyrata</i>)	40	24 (60%)	6 (15%)	8 (20%)	2 (5%)		B
8.	Can Gio	Baby clam (<i>Meretrix lyrata</i>)	36	28 (77.8%)	4 (11.1%)	4 (11.1%)	0		B
9.	Duyen Hai	Baby clam (<i>Meretrix lyrata</i>)	35	35 (100%)	0	0	0		A
10.	Ba Lua	Yellow clam (<i>Paphia undulata</i>)	20	20 (100%)	0	0	0		A

Note: Classification requirements for A area are in line with Commission Regulation (EU) 2019/627 of 15 March 2019.

PART II.
PLAN FOR THE SANITATION MONITORING PROGRAM FOR BIVALVE MOLLUSC PRODUCTION AREAS IN 2020

1. Species:

- Baby clam (*Meretrix lyrata*);
- Yellow clam (*Paphia undulata*);
- Antique ark (*Anadara antiquata*);
- Scallop (*Chlamys nobilis*).

2. Scope:

The Program 2020 will be implemented in 15 bivalve mollusc production areas located in 10 following provinces/cities: Thai Binh, Nam Dinh, Ho Chi Minh City, Tien Giang, Ben Tre, Tra Vinh, Kien Giang and Binh Thuan.

Table 5: Scope and species of the Monitoring Program 2020

No.	Production areas	Approval number	Species
1.	Tien Hai	TH	Baby clam (<i>Meretrix lyrata</i>)
2.	Giao Thuy	GT	Baby clam (<i>Meretrix lyrata</i>)
3.	Nghia Hung	NH	Baby clam (<i>Meretrix lyrata</i>)
4.	Kim Son ^(*)	KS	Baby clam (<i>Meretrix lyrata</i>)
5.	Hau Loc Nga Son ^(*)	HL	Baby clam (<i>Meretrix lyrata</i>)
6.	Tan Thanh	GC	Baby clam (<i>Meretrix lyrata</i>)
7.	Binh Dai	BD	Baby clam (<i>Meretrix lyrata</i>)
8.	Ba Tri	BT	Baby clam (<i>Meretrix lyrata</i>)
9.	Thanh Phu	TP	Baby clam (<i>Meretrix lyrata</i>)
10.	Can Gio	CG	Baby clam (<i>Meretrix lyrata</i>)
11.	Tuy Phong	TU	Antique ark (<i>Anadara antiquata</i>)
			Scallop (<i>Chlamys nobilis</i>)
12.	Ham Tan	HA	Antique ark (<i>Anadara antiquata</i>)
13.	Phan Thiet	PT	Antique ark (<i>Anadara antiquata</i>)
			Scallop (<i>Chlamys nobilis</i>)
14.	Duyen Hai	DH	Baby clam (<i>Meretrix lyrata</i>)
15.	Ba Lua	BL	Yellow clam (<i>Paphia undulata</i>)

Note: (*): EU authorities agree to add 02 new bivalve mollusc production areas to the approval list from 26 February 2020

4. Sampling plan:

a. Overall plan:

Table 6: Overall sampling plan for BM Monitoring Program in 2020

No	Production areas	Sampling points	Number of samplings	Number of samples		Remark
				BM	Water	
1.	Tien Hai (TH)	1	26	26	52	
2.	Giao Thuy (GT)	1	26	26	52	
3.	Nghia Hung (NH)	1	26	26	52	
4.	Kim Son (KS)	1	26	26	52	
5.	Hau Loc Nga Son (HL)	1	26	26	52	
6.	Tan Thanh (GC)	1	26	26	52	
7.	Binh Dai (BD)	2	26	52	104	
8.	Ba Tri (BT)	1	26	26	52	
9.	Thanh Phu (TP)	1	26	26	52	
10.	Can Gio (CG)	1	26	26	52	
11.	Tuy Phong (TU)	2	-	6	-	Scallops and antique arks at these areas are under intensive sampling for Cadmium once every 4 months; harvest is allowed if the result is satisfactory.
12.	Phan Thiet (PT)	2	-	6	-	
13.	Ham Tan (HA)	1	-	3	-	
14.	Duyen Hai (DH)	1	26	26	52	
15.	Ba Lua (BL)	1	25	25	50	No sampling from June to November 2020 (for resource protection); this area is not affected by the tide.
Total				337	674	

b. Testing criteria: Toxin-producing plankton, biotoxins (ASP, PSP, Lypophylic), pathogenic microorganisms (*E. coli*, *Salmonella*, *Norovirus*), organochlorinated pesticides, heavy metals (Cd, Hg, Pb)

PART III. CONCLUSIONS

The Sanitation Monitoring Program for Bivalve Molluscs Production areas in 2019 in Vietnam was implemented in compliance with Vietnamese regulations and met EU's requirements.