



SEAFDEC/AQD's AQUATIC ANIMAL HEALTH ACTIVITIES IN THE REGION

Presented by:



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Head, Research Division and Fish Health Section

SEAFDEC/AQD

Southeast Asian Fisheries Development Center (SEAFDEC)



- An autonomous intergovernmental association established to promote fisheries development in Southeast Asia in 1967
- Aims to develop fishery potentials in Southeast Asia through research, training, and information services
- Composed of 11 Member Countries (including Japan)
- 5 Departments + Secretariat

Departments

  **Secretariat**
Coordination of general policies and planning of SEAFDEC

  **Training Department (TD)**
Development of modern fishery techniques to enhance selective harvest rates (marine capture fisheries)

  **Marine Fisheries Research Department (MFRD)**
Fisheries post-harvest technology and development of fish processing industry

  **Marine Fishery Resources Research Development & Management Department (MFRDMD)**
Sustainable management of fishery resources, assessment, conservation, and management of sea turtles

  **Inland Fishery Resources Development & Management Department (IFRDMD)**
Sustainable development and management of inland capture fisheries in the Southeast Asian region

  **Aquaculture Department (AQD)**
To develop the aquaculture potentials of the region. Closely coordinates with the DA of the Philippines

Southeast Asian Fisheries Development Center Aquaculture Department (SEAFDEC/AQD)

- Established in 1973 in Tigbauan, Iloilo, Philippines
- Mandated to:
 - Promote and undertake research on aquaculture relevant and appropriate to the region
 - Encourage human resource development in aquaculture through training and extension
 - Disseminate and exchange information in aquaculture

Activities



Aquaculture
Research



Training



Publication



Library &
Museum Tours



Extension &
Production



Laboratory
Services

Divisions



Research Division
(RD)



Technology
Verification &
Extension Division
(TVED)



Training &
Information Division
(TID)



Administration &
Finance Division
(AFD)



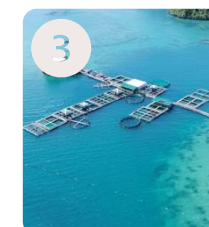
Stations



Tigbauan Main
Station (TMS)



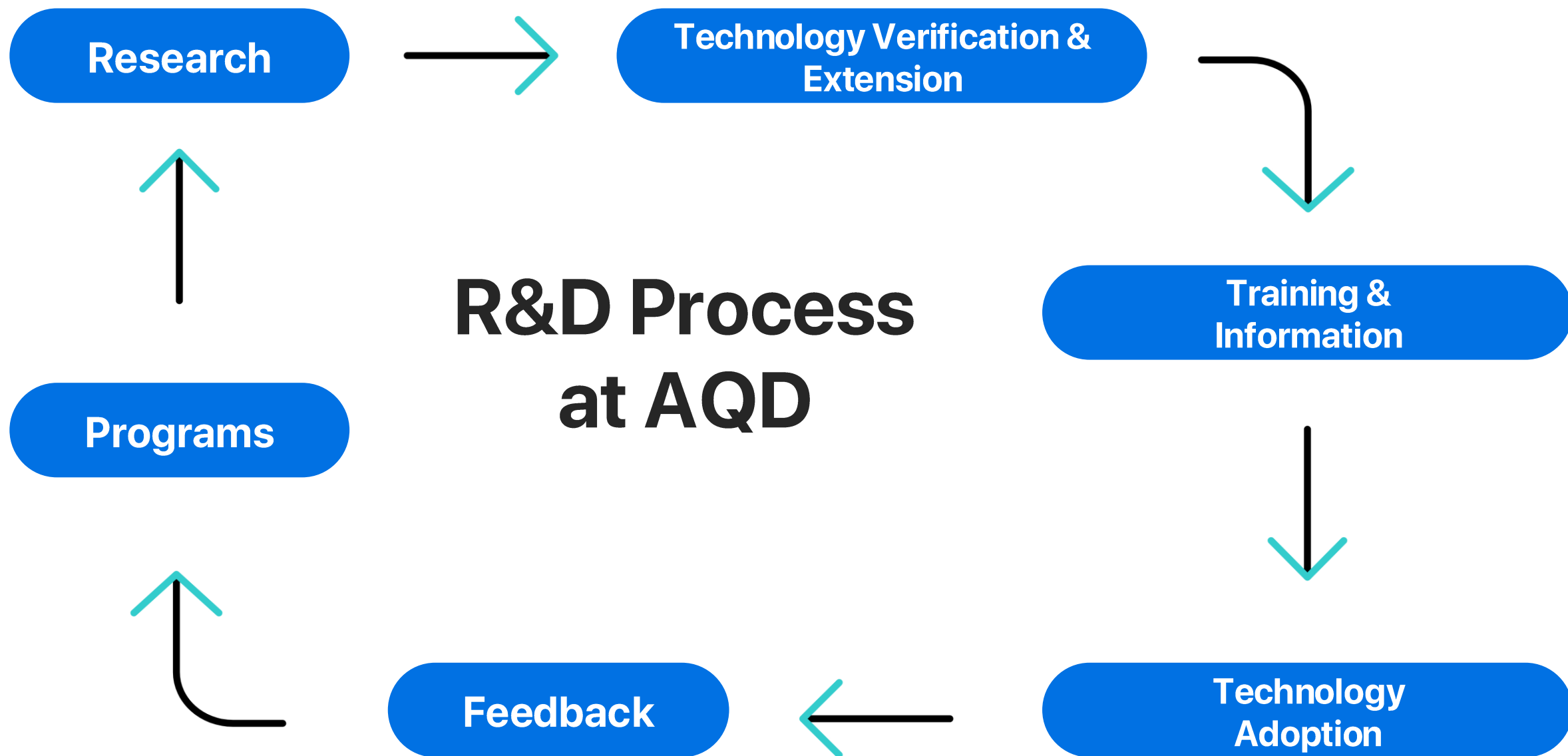
Dumangas
Brackish-water
Station (DBS)



Igang Marine
Station (IMS)

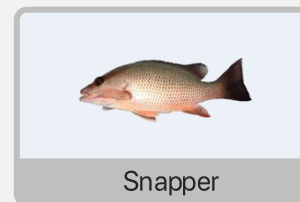
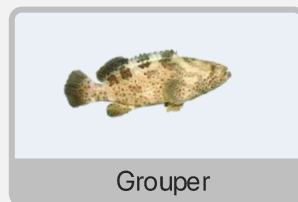
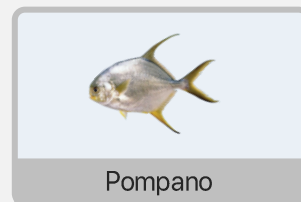
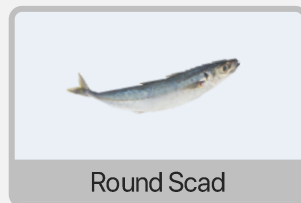


Binangonan
Freshwater
Station (BFS)

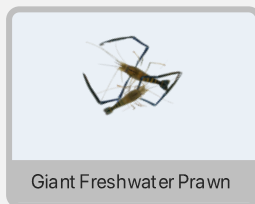


Commodities at AQD (Total: 27)

Finfish (13)



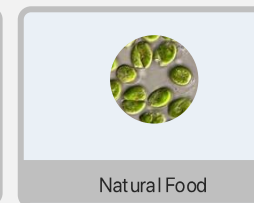
Crustaceans (7)



Mollusks (3)



Others (4)



Thrusts of SEAFDEC/AQD



1. Fry Sufficiency Program



2. Development of Cost Efficient Feeds



3. Oplan Balik Sugpo
(Operation Black Tiger Shrimp Revival)



4. Joint Mission for Accelerated
Nationwide Technology Transfer
Program (JMANTTP II)



5. Manpower Development



6. Production of priority
commodities using innovative
aquaculture technologies

Thematic Programs of AQD

Serve as the backbone of SEAFDEC/AQD's research efforts



Quality Seed for Sustainable Aquaculture (QSSA)

Generate, verify, and promote technologies to ensure the sustainable production of quality seed stock for aquaculture as well as for stock enhancement



Maintaining Environmental Integrity through Responsible Aquaculture (MEITRA)

Develop sustainable aquaculture technologies by integrating environmental factors in SEAFDEC/AQD research activities and maintain environmental integrity by promoting responsible aquaculture practices



Healthy and Wholesome Aquaculture (HWA)

Improve aquaculture production through innovations in nutrition and feeding, fish health management, and in maintaining the environmental integrity of the aquaculture systems



Meeting Social and Economic Challenges in Aquaculture Program (MSECAP)

Develop and implement social and economic strategies in aquaculture and resource management to secure food and income through stakeholder collaboration

Thematic Programs of AQD

Serve as the backbone of SEAFDEC/AQD's research efforts

2026 Distribution of studies

50
(AQD:44, GOJ-TF: 6)

Studies

*Under the Departmental
and Regional Programs*



QSSA

21

Studies

HWA

10

Studies

MEITRA

9

Studies

MSECAP

04

Studies

Regional Programs
Including GOJ-TF Studies

06

Studies

HWA

Healthy and Wholesome Aquaculture

Improve aquaculture production through innovations in nutrition and feeding, fish health management, and in maintaining the environmental integrity of the aquaculture systems

Under HWA:

10

Studies

(AQD:8, GOJ-TF: 2)

1

Fish Health Component

It aims to improve aquaculture production through innovations in disease management, as well as diagnosis, control, monitoring, and surveillance of aquatic animals



2

Nutrition and Feed Component



Study Title:

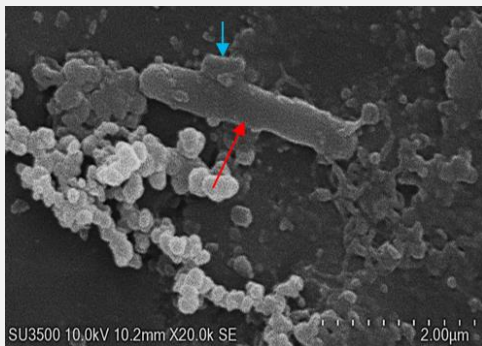
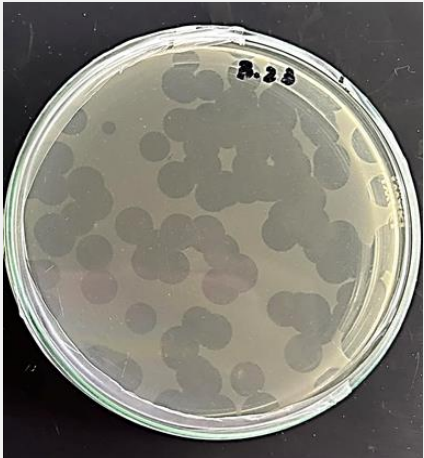
Exploiting Predatory Bacteria: Development of Efficient Administration Technology of Marine Predatory Bacteria as Antimicrobial Therapy for Shrimp *Vibrio* Disease Management

Significance

Utilizes predatory bacteria such as *Bdellovibrio* and like organisms (BALOs) which provides another way to control *Vibrio* and other bacterial pathogens in shrimp aquaculture

Progress

- Isolation of *Halobacteriovorax vibriovivans* from pond sediments of Dumangas Brackishwater Station (DBS) that can lyse *V. parahaemolyticus*, *V. harveyi*, *V. alginolyticus*, *V. cholerae*, *Pseudomonas luteola* and *Aeromonas hydrophila*.
- In vitro* bacteriolytic test** was conducted through the liquid preparation of *H. vibriovivans* and probiotic *Bacillus badius*. The results showed a decrease in Vp_{AHPND} after 24 h and total inhibition attained by BALOs at Day 5 (BALOs 10^6), Day 6 (BALOs 10^4), and Day 7 (BALOs 10^2). A decrease in Vp_{AHPND} was observed after 24 h with *B. badius*, but it did not achieve total inhibition compared to BALOs treatment.



Shrimp

P. Monodon & *L. vannamei*

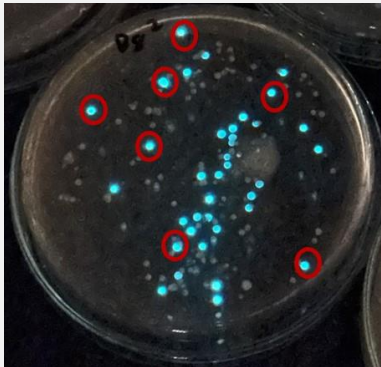
Study Title:

Exploiting Predatory Bacteria: Development of Efficient Administration Technology of Marine Predatory Bacteria as Antimicrobial Therapy for Shrimp Vibrio Disease Management



Shrimp

P. Monodon & L. vannamei



Progress

- Successful microencapsulation of BALOs through freeze drying methods of liquid preparations
- Microencapsulated BALOs shows decrease in Vp_{AHPND} from 10^6 CFU ml⁻¹ to 10^2 CFU ml⁻¹ during the 8 days *in vitro* culture.
- Encapsulated BALOs at **800, 1000, and 1500 mg/kg** were found to be non-pathogenic in shrimp, and the addition frequency for growth and survival over 45 days was once every 7 days in the feed.
- Preliminary results of ongoing microcosm experiments of encapsulated BALOs supplementation show a significant decrease in total presumptive vibrio count at all dosages at Day 75 (*ongoing up to Day 120*)
- Ongoing challenge tests of encapsulated BALOs against *V. harveyi* and Vp_{AHPND}

Study Title:

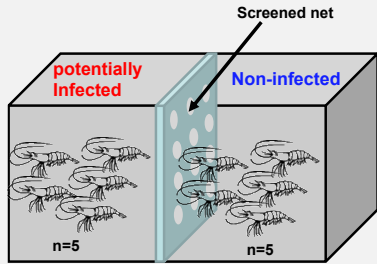
Control, Management, and Determination of Spore Activation and Infectivity of *Enterocytozoon hepatopenaei* (EHP) in Shrimps

Significance

- Determine the etiological factors that help the activation of EHP spores and their infectivity in shrimp
- Aid in determining inhibitors that will contribute to developing management and control measures

Progress

- Cohabitation of EHP-infected *P. monodon* with apparently healthy *M. rosenbergii* shows transmission at **35 days**, while for apparently healthy *L. vannamei*, transmission occurs at day 45. For interspecies transmission, both *M. rosenbergii* and *L. vannamei* successfully transmitted EHP at 15 days.
- Continuous reinfection in *P. monodon*, *P. vannamei*, and *M. rosenbergii* is currently being conducted.
- Additionally, the temperature for spore inactivation and other etiological factors contributing to the infectivity and activation of EHP spores was investigated
 - Different temperatures for storage of EHP spores were tested: -10 °C, -20 °C, -30 °C, and -80 °C for 60 days. Results showed that *all temperatures yielded positive results*, but only **nested (+)** from the initial first-step EHP-positive *after 60 days of cold storage*.



N=10 / per aquarium



Study Title:

Improvement of productivity and quality of cultured seaweeds

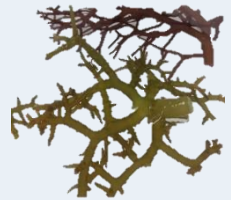


Significance

- Identification of putative microorganisms causing “ice-ice” (IID) disease in seaweed.
- Determine the changes in culturable microbial diversity in a sea-based farm affected by IID in relation to seasonal environmental conditions
- Establishing guidelines and GAqP for IID mitigation in seaweeds

Progress

- Experimental runs for dry and wet seasons, along with isolation of ice-ice disease-causing bacteria, have been conducted
- Molecular identification of the prevalent bacteria during IID incidence will be conducted, followed by experimental infection of healthy seaweed for confirmation
- $0-10^1$ (cfu/g) bacterial colonies were recorded in healthy seaweeds
- IID was detected in seaweed stocks at DOC 30 and DOC 45
- Presumptive carrageenan-lysing bacteria, *Pseudomonas* and *Vibrio* species, were predominantly observed and isolated in seaweeds affected by IID



Seaweed
Kappaphycus alvarezii

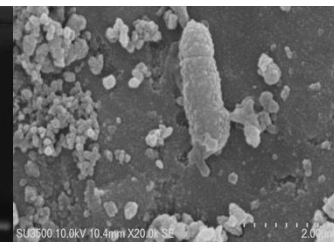
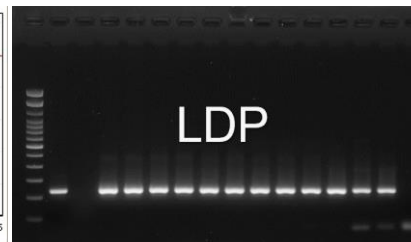
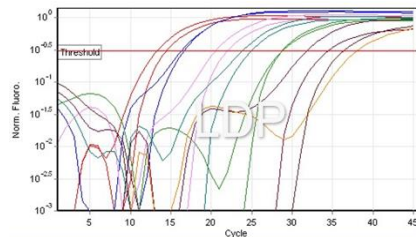
Disease Diagnostics at SEAFDEC/AQD



Level I
(Dissection/Gross Examination/
Microscopy)



Level II
(Bacteriology, Histopathology,
Parasitology, and others)



Level III
(Molecular Biology, Virology,
Electron Microscopy)

Analytical Services Laboratory

Sample Type	Test / Parameter	Test Method	Fee per Sample (PHP)	Sample requirements
Soil	pH	Potentiometric		100 grams, dry and powdered in airtight plastic container / Ziplock pouch
	Iron	Ammonium Acetate Extraction		
	Organic Matter	Walkley-Black		
	Available Phosphorus	Modified Olsen's Method		
	Available Sulfur	Turbidimetric		



Microbiological Analyses

Sample Type	Test / Parameter	Test Method	Fee per Sample (PHP)	Sample requirements
Water	Total Coliform Count	Drinking Non-potable		500 ml in a container provided by the laboratory
	Fecal Coliform Count	Drinking Non-potable		
	Heterotrophic Plate Count	Pour Plate Method, SMEWW		
	Total Coliform Count (Collitert-18)	Enzyme Substrate Coliform Test, SMEWW		
Food	Total Coliform Count	MTFT, BAM		500 g in sterile container or Ziplock pouch
	Fecal Coliform Count	MTFT, BAM		
	Aerobic Plate Count (APC)	Pour Plate Method, BAM		
	Vibrio spp.	BAM		
	Salmonella spp.	BAM		
	Yeast / mold count	BAM		
	Staphylococcus aureus	BAM		



Electron Microscopy

Note: Every additional photomicrograph will be charged PHP 60.00

Sample Type	Test / Parameter	Test Method	Fee per Sample (PHP)	Sample requirements
Biological / Non-biological samples	Morphology (with 6 photomicrographs)	Scanning Electron Microscope	3,180.00	5 mm x 5 mm (L x W)

Revised April 2025



AQUACULTURE DEPARTMENT
Southeast Asian Fisheries Development Center

ANALYTICAL SERVICES



Chemical Analyses



Microbiological Analyses



Electron Microscopy

All inquiries, clarifications, and samples must be coordinated directly with:

Laboratory Facilities for Advanced Aquaculture Technologies (LFAAT)

✉ lfaat@seafdec.org.ph
+63 (33) 511 9170 local 1112
☎ +63 (33) 330 7017



Chemical Analyses

Sample Type	Test / Parameter	Test Method	Fee per Sample (PHP)	Sample requirements
Feeds	Moisture	AOAC, 20th Ed. 930.15		50 grams dry sample in airtight plastic container / Ziplock pouch
	Crude Protein	AOAC, 20th Ed. 984.13 (Modified)		
	Ash	AOAC, 20th Ed. 942.05		
	Crude Fat	Soxtec Analyzer		
	Crude Fiber	Filter Bag Technology by Ankom Analyzer		
	Complete proximate analysis	See above		
	Calcium	AAS, AOAC		
	Copper	AAS, AOAC		
	Iron	AAS, AOAC		
	Magnesium	AAS, AOAC		
Feed ingredients	Phosphorus (from original sample)	Photometric, AOAC		For dry sample, 50 grams. If wet, coordinate with the laboratory.
	Phosphorus (from ash)	Photometric, AOAC		
	Moisture (Dry sample)	Moisture Analyzer		
	Moisture (Wet sample)	Oven drying, AOAC		
	Crude Protein	Automated Kjeltec Analyzer		
	Ash	AOAC		
	Crude Fat	Soxtec Analyzer		
	Crude Fiber	Filter Bag Technology by Ankom Analyzer		
	Complete proximate analysis	See above		
	Calcium	AAS, AOAC		
	Copper	AAS, AOAC		
	Iron	AAS, AOAC		
	Magnesium	AAS, AOAC		
	Phosphorus (from original sample)	Photometric, AOAC		
	Phosphorus (from ash)	Photometric, AOAC		



PAB accredited (ISO/IEC 17025:2017)

Sample Type	Test / Parameter	Test Method	Fee per Sample (PHP)	Sample requirements
Fish, marine products, meat and meat products	Moisture (Dry sample)	Moisture Analyzer		For dry sample, 50 grams. If wet, coordinate with the laboratory.
	Moisture (Wet sample)	Oven drying, AOAC		
	Crude Protein	Automated Kjeltec Analyzer		
	Ash	AOAC		
	Crude Fat	Soxtec Analyzer		
	Crude Fiber	Filter Bag Technology by Ankom Analyzer		
	Complete proximate analysis	See above		
Water	pH	APHA-AWWA-WEF, 23rd Ed.		100 ml (PET bottle)
	Ammonia-Nitrogen	APHA-AWWA-WEF, 23rd Ed.		100 ml (PET bottle)
	Nitrite-Nitrogen	APHA-AWWA-WEF, 23rd Ed.		100 ml (sampling bottle provided by the lab)
	Phosphorus	APHA-AWWA-WEF, 23rd Ed.		100 ml (sampling bottle provided by the lab)
	Nitrate+Nitrite-Nitrogen	Skalar Methods		100 ml (PET bottle)
	Nitrate-Nitrogen	Skalar Methods, SMEWW		100 ml (PET bottle)
	Total Ammonia Nitrogen	Skalar Methods		500 ml (PET bottle)
	Alkalinity	Titration		500 ml (PET bottle)
	Hardness	EDTA Titration, SMEWW		300 ml (DO bottle)
	Dissolved oxygen	Azide Modification, SMEWW		500 ml (PET bottle)
	Total Suspended Solids	Oven drying, SMEWW		500 ml (dark colored PET bottle)
	Chlorophyll	Spectrophotometric, SMEWW		500 ml (dark colored PET bottle)
	Calcium	AAS, SMEWW		500 ml (PET bottle)
	Copper	AAS, SMEWW		500 ml (PET bottle)
	Iron	AAS, SMEWW		500 ml (PET bottle)
	Magnesium	AAS, SMEWW		500 ml (PET bottle)

*dry sample
**wet sample

Note: Complete proximate analysis includes moisture, crude protein, ash, crude fat, crude fiber, nitrogen-free extract

Diagnostic Laboratory

Test	Fee (per sample)
Quantitative PCR (q-PCR)	
• tissue samples	
• soil samples	
	PHP
	PHP

Nucleic acid extraction

Service	Fee (per sample)
Deoxyribonucleic acid (DNA) extraction	PHP
Ribonucleic acid (RNA) extraction	PHP

Revised March 2025

References

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- Bacteriological Analytical Manual. US FDA. (online) fda.food/gov/laboratory
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- Bel, T. A. and Lightner, D.V. 1998. A Handbook of normal penaeid shrimp histology. The World Aquaculture Society. Allen Press Inc., Lawrence, Kansas
- IQ2000TM Detection and Prevention System, GeneReach Biotechnology Corp., Taiwan
- Tang, KFJ and Lightner, DV. 2001. Detection and quantification of infectious hypodermal and hematopoietic necrosis virus in penaeid shrimp by real-time PCR. Diseases of Aquatic Organisms, 44(2):79-85.
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- Dong HT, Siriroob S, Meemetta W, Santimanawong W, Gangnonngiw W, Pirarat N, Khunrae P, Ratanaropong T, Vanichvirayak R and Senapin S. 2017. Emergence of tilapia lake virus in Thailand and an alternative semi-nested RT-PCR for detection. Aquaculture 476: 111-118.
- Sri Widada J, Richard Y, Shi Z, Qian D, Bonami JR. Dot-blot hybridization and RT-PCR detection of extra small virus (XSV) associated with white tail disease of prawn *Macrobrachium rosenbergii*. Dis Aquat Organ. 2004 Jan 28;58(1):83-7
- Hameed ASS, Yoganandhan K, Widada JS and Bonami JR. 2004. Studies on the occurrence of *Macrobrachium rosenbergii* nodavirus and extra small virus-like particles associated with white tail disease of *M. rosenbergii* in India by RT-PCR detection. Aquaculture 238(1-4): pp127-133.

For method of sampling and schedule of sample submission, contact:

Fish Health Section
SEAFDEC/AQD

✉ fishhealth@seafdec.org.ph
☎ +63 953 1044 474
+63 33 330 7015



AQUACULTURE DEPARTMENT
Southeast Asian Fisheries Development Center

FISH HEALTH LABORATORY SERVICES



Bacteriology



Histopathology



PCR-based pathogen
detection



Bacteriology

Test	Fee (per sample)
Bacterial enumeration 1,2	
<i>Vibrio parahaemolyticus</i> , <i>Vibrio cholerae</i> , and <i>Vibrio alginolyticus</i> detection 1,2	
Bacterial identification Analytical Profile Index (API) Conventional	
Microbial sensitivity	

Fungi

Test	Fee (per sample)
Aflatoxin detection 3	

Parasitology

Test	Fee (per sample)
Parasite detection	



Histopathology

Service	Fee (per slide)
Typical section 4,5	
Serial section 4,5	

Microscopy

Service	Fee (per sample)
Larval/fry quality monitoring	



Culture media preparation

Service	Fee (per sample)
Nutrient Agar	PHP
Thiosulfate Citrate Bile Salt Sucrose Agar (TCBS)	PHP
<i>Vibrio</i> Chromogenic Agar (VCA)	PHP
Mueller Hinton Agar (MHA)	PHP
<i>Pseudomonas-Aeromonas</i> Selective Agar (GSP)	PHP

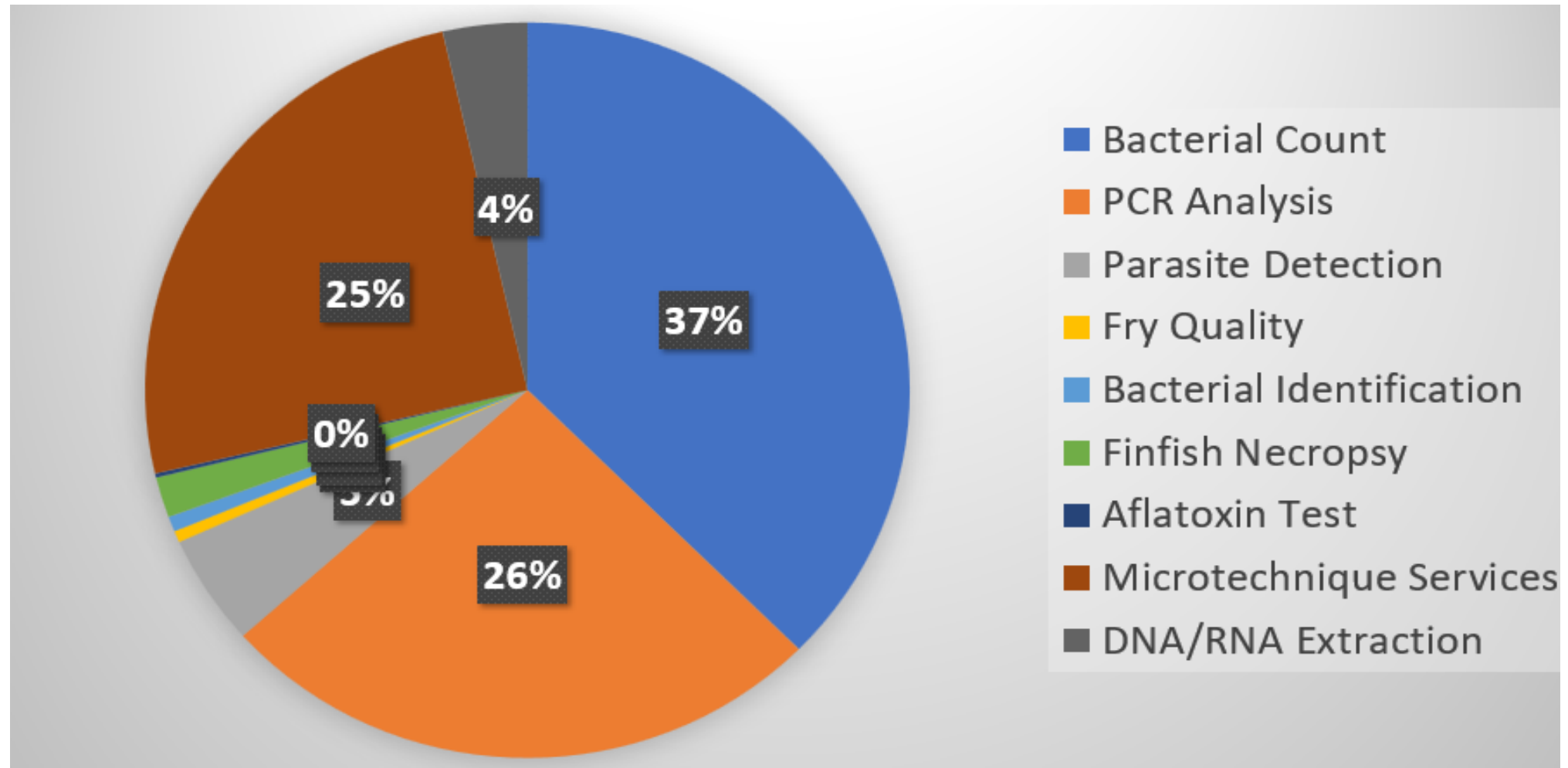


PCR-based pathogen detection

Test	Fee (per sample)
Shrimp pathogens	
White spot syndrome virus (WSSV) ⁶	PHP
Infectious hypodermal and hematopoietic necrosis virus (IHHNV) ⁶	PHP
Taura syndrome virus (TSV) ⁶	PHP
Yellow head virus (YHV) ⁶	PHP
Gill associated virus (GAV) ⁶	PHP
Infectious myonecrosis virus (IMNV) ⁶	PHP
Monodon baculovirus (MBV) ⁶	PHP
Hepatopancreatic parvo virus (HPV) ⁶	PHP
White tail disease (WTD)	PHP
• Extra small virus (XSV) ¹²	
• <i>Macrobrachium rosenbergii</i> nodavirus (MrNV) ¹³	
Acute hepatopancreatic necrosis disease (AHPND) ⁹	PHP
<i>Enterocytozoon hepatopenaei</i> ⁶	PHP
Fish pathogens	
Koi herpes virus (KHV) ⁶	PHP
Viral nervous necrosis (VNN) ⁶	PHP
Red seabream iridovirus (RSIV) ¹⁰	PHP
Tilapia lake virus (TILV) ¹¹	PHP

Summary of Services

(1st - 2nd Quarter 2026)



SEADEC/AQD Publications

renowned for consistently publishing and disseminating essential research and manuals to advance aquaculture

From 1976 to 2025

1,249

Scientific Journals

136

Aquaculture Extension
Manuals

186

Book
Chapters

427

Conference
Proceedings

29

Magazines

For 2026 (Jan – July)

13

Scientific Journals

3

Aquaculture Extension
Manuals

0

Book
Chapters

1

Conference
Proceedings

2

Magazines



SEAFDEC/AQD Rankings

A globally recognized, regional leader in tropical aquaculture research and technology transfer



Philippines

AD Scientific Index 2026



All Institutions in the Philippines
(Including Universities)

18

Country
Rank

3645

Region
Rank

9468

World
Rank

Institutions in the Philippines

03

Country
Rank

609

Region
Rank

2015

World
Rank

A large underwater scene filled with many fish, likely a school of silver fish, swimming in clear blue water. The fish are of various sizes and are swimming in different directions, creating a sense of movement and depth. The text "Thank you for listening!" is overlaid on the left side of the image in a large, white, sans-serif font.

Thank you for listening!