

SAYAWIT. With the theme "Folk songs and dances about the sea, fishing, fish, and other marine organisms," pupils from Hibao-an Elementary School did a dance and song performance about the life at seas – both around it and underneath it. See Page 14 for more activities during FishWorld's Aquaweeek 2019. **PHOTO BY JF ALDON**

Sci-Art

AquaWeek

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aqd matters

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Newsletter of the SEAFDEC Aquaculture Department, Tigbauan, Iloilo, Philippines

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Cost of hatchery operations seen to go down via technology for algal paste production



The Evodos dynamic settler used in microalgae production at SEAFDEC/AQD. **PHOTO BY JF ALDON**

Santiago says experts must work together, brainstorm for the development of aquaculture and other stories from SEAFDEC/AQD's 46th Anniversary Program on **Page 8**

AN AWARD-winning technology for algae harvesting is now available in the Philippines, boosting efforts to reduce the cost of producing fish fry in hatcheries through the use of algal paste.

An Evodos dynamic settler unit, using spiral plate technology which received a

gold award for outstanding algae harvesting performance from the Algae Industry Magazine's 2015 International Readers' Poll, was recently acquired by the Southeast Asian Fisheries Development Center/Aquaculture Department (SEAFDEC/AQD).

Such technology is the first in the Philippines and the third in Asia after Hong Kong and Viet Nam.

Algal paste is an alternative to live algal food for fish larvae, lowering the cost of hatchery operations by eliminating the need for a laboratory facility and algal

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tanks which are expensive to build and maintain.

This new harvesting equipment that can lower the cost of hatchery production is used to produce algal paste that can be used for all types of microalgae, according to Ms. Annie Franco, leader of the SEAFDEC/AQD Natural Food Commodity Team. "It is just a simple machine that separates the water from the live culture to produce a concentrated form," she said.

Moreover, this equipment is more efficient than conventional centrifuges

when it comes to the dry weight of the output algae paste which can be used as a starter for algal culture or for direct feeding to fish larvae.


"The Evodos dynamic settler can achieve a dry weight percentage of 200-400 grams per liter as compared to less than 150 grams per liter for other conventional centrifuges," said Ms. Franco. In addition, the dynamic settler has a separation efficiency of 95 percent and has a 100 percent retention of valuable cell components, leaving the algae intact and undamaged.

According to Ms. Franco, SEAFDEC/AQD's Larval Food Laboratory is dedicated to serving the microalgal starter needs of hatcheries of the institution as well as the aquaculture industry, academe, and government institutions in the country.

She said that on a daily basis, the laboratory can produce 5-15 kilograms of microalgae paste.

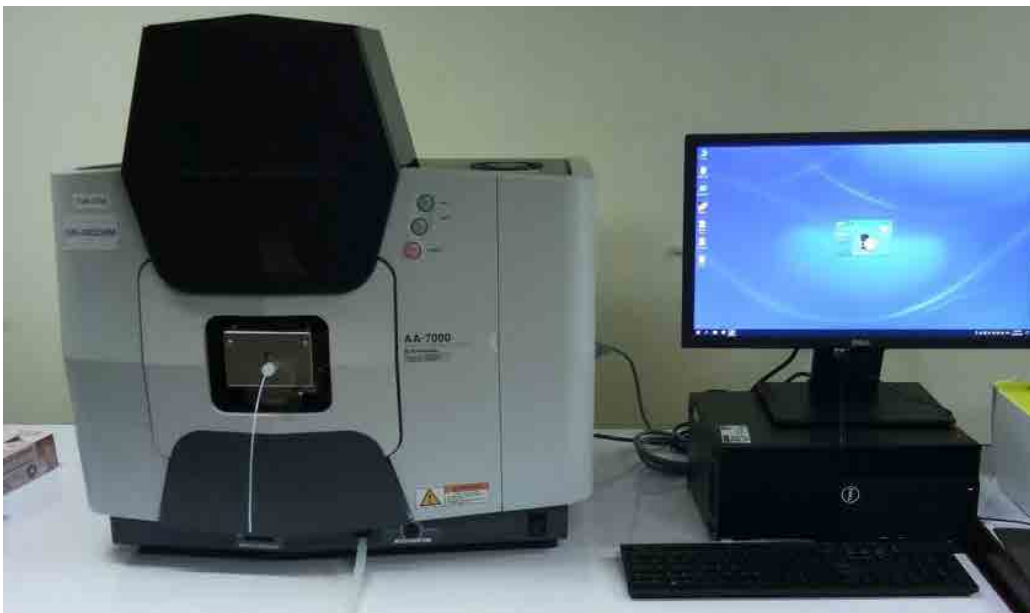
"There will be an improvement in the delivery to the clients as we can send as much as 5 kilograms of paste instead of 20 liters of live microalgae which entail high air freight cost," she said.

She further explained that clients particularly those located in Luzon and Mindanao can have some savings because of lower freight cost since the microalgae are already in concentrated form.

SEAFDEC/AQD's Larval Food Laboratory accepts orders on a first-come-first-served basis. Orders may be sent to Ms. Annie Franco at avfranco@seafdec.org.ph or Ms. Ellen Ledesma at egtisuela@seafdec.org.ph or call (033) 330-7000 local 1129. 

—RH LEDESMA

Testing for metallic elements and heavy metals; improved analytical services now available at AQD



The new atomic absorption spectrophotometer at the Laboratory Facilities for Advanced Aquaculture Technologies at SEAFDEC/AQD. PHOTO BY LFAAT

THE LABORATORY Facilities for Advanced Aquaculture Technologies (LFAAT) now has the capability to detect metallic elements in water and animal samples, Laboratory Manager Engr. Margarita Arnaiz announced.

LFAAT recently acquired an atomic absorption spectrophotometer (AAS)

that allows the laboratory to determine the presence and concentration of heavy metals and other metallic elements in the culture environment and in aquatic animals.

Engr. Arnaiz said the new instrument will allow researchers to begin studies on the food safety of aquaculture products, particularly on the levels of heavy metal contamination.


The AAS, a Shimadzu AA-7000 model, may also be used for the analysis of river effluent, sludge, airborne dust, semiconductors, ceramics, petroleum, oil, catalysts, chemical products, blood, plants, drugs and food products.

The laboratory's capability to detect *E. coli* and coliform bacteria also received a

boost with the acquisition of instrumentation and its accessories to conduct a Colilert® test. The internationally approved method is specific to *E. coli* and coliform, simultaneously detecting their presence and quantity within 24 hours.

Lastly, Engr. Arnaiz announced the acquisition of a continuous flow analyzer (CFA), a Skalar SAN++, which now allows LFAAT to measure total ammonia-nitrogen in water samples. The CFA also improves the laboratory's capability to measure ammonia, nitrate and nitrite.

The unveiling of the new LFAAT services was done as part of SEAFDEC/AQD's 46th anniversary activities last 11 July 2019.

The LFAAT operates in support of SEAFDEC/AQD's research projects but also accepts samples from the public. Inquiries for analytical services may be sent to analyses@seafdec.org.ph. 

—RD DIANALA

Expert establishes viability of giant freshwater prawn



Dr. Maria Lourdes Aralar presents her research on giant freshwater prawn during the 27th Dean Domiciano K. Villaluz (DKV) Memorial Lecture last 11 July 2019. PHOTO BY JM DE LA CRUZ.

AFTER serving at SEAFDEC/AQD for more than 32 years, Dr. Maria Lourdes Cuvin-Aralar, who recently retired as scientist, shared in a memorial lecture her career achievements in establishing the commercial and environmental viability of producing giant freshwater prawns through cage culture.

"Cage culture is suited for marginalized fish farmers who have no land to develop into ponds. It also requires very minimal start-up investment," said Dr. Aralar during her lecture as speaker for the 27th Dean Domiciano K. Villaluz (DKV) Memorial Lecture held last 11 July 2019 at AQD's Tigbauan Main Station.

This year's forum and clinic, which lasted the entire day, was attended by 187 participants who were mostly local fish farmers, pond operators, government officials, and members of the academe.

With various refinements in stocking density and feeding techniques, cage culture of giant freshwater prawn can be a very feasible option for aquaculture farmers. It used to be a 'neglected' species as the market favored other marine crustaceans.

However, Dr. Aralar presented the commodity as an alternate high-value crustacean species to freshwater commodities such as carp, tilapia, and catfish. To further prove its practicability, giant freshwater prawn can be polycultured with the aforementioned species as supported by related studies also done in AQD.

Dr. Aralar also presented current problems including depleting wildstocks in many of the country's inland waters despite the fact that this commodity is native to the Philippines. This is usually due to degradation of riverine routes to estuaries.

"Farming of this species will not only be good for fish farmers but also for the

environment as it can be a way of bringing stocks back to the inland waters," Dr. Aralar added.

The annual DKV Memorial Lecture honors distinguished experts from different fields in aquaculture and is held every AQD anniversary in remembrance of the first AQD Chief. **a**

—JM DELA CRUZ

SEAFDEC/AQD at marine science symposium



BANGA, Aklan – In support of the 15th National Symposium on Marine Science held 4-6 July 2019 at Aklan State University, SEAFDEC/AQD promoted its laboratory services and distributed publications in an onsite exhibit booth. Over 500 marine science experts and students converged at the symposium which was organized by the Philippine Association of Marine Science (PAMS) with AQD associate scientist Dr. Jon Altamirano as its current Vice President for Visayas. Dr. Altamirano and Associate Scientist Dr. Nerissa Salayo served as chairs for the sessions on smart aquaculture and community engagement, respectively.

Photo by JF Aldon.

Fish farmers, private sector, get important aquaculture updates



Participants of the Farmers' Forum and Aquaculture Clinic pose for a group photo at AQD's Multi-Purpose Hall in Tigbauan, Iloilo. PHOTO BY JM DE LA CRUZ

AS PART of SEAFDEC/AQD's anniversary celebrations, a Farmers' Forum and Aquaculture Clinic were held for fish farmers and the private sector that updated them on important aquaculture developments on bangus fry sufficiency, shrimp hatchery management, hatchery technology for mangrove crab, and the need to culture mud worms.

The Forum attended by more than 100 participants was held on 10 July 2019 at SEAFDEC/AQD's Multi-

Purpose Hall in Tigbauan, Iloilo from 8 a.m. to 3 p.m.

National Bangus Fry Sufficiency Program

Dr. Edgar Amar, head of the Training and Information Division, shared to the attendees that there is a scarcity of milkfish fry in the Philippines and that the solution to address this problem is to increase the local fry production through the "Bangus Fry Sufficiency Program" of the Philippine government.

With this program, Dr. Amar said there will be centralized broodstock facilities where broodstock maintenance will be supported by the government and central and satellite hatcheries will focus on egg and fry production, respectively.

"This program also offers lower investment requirements to encourage private hatcheries to consider this aquaculture venture," said Dr. Amar, adding that one of the roles of SEAFDEC/AQD

in this particular program is to train technical staff to be deployed in the legislated multi-species hatcheries nationwide wherein there are currently 19 trained technical staff.

In addition, SEAFDEC/AQD will serve as the Central Hatchery that will supply the milkfish egg requirement of satellite hatcheries in Region 6 as well as provide technical assistance in the operation of the satellite hatcheries to the Bureau of Fisheries and Aquatic Resources Region 6.

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SEAFDEC/AQD experts Dr. Edgar Amar, Dr. Leobert de la Peña, Ms. Mary Anne Mandario, and Ms. Joana Joy Huervana talk about the updates of the research projects done at the institution. PHOTO BY JM DE LA CRUZ

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Shrimp hatchery management

On the other hand, Dr. Leobert de la Peña, head of the Research Division, gave updates on shrimp hatchery management where he presented the shrimp hatchery and spawner/broodstock facilities at SEAFDEC/AQD.

Dr. de la Peña also shared how biosecurity measures are practiced in these facilities such as the use of foot bath and hand sanitizer, disinfection of tanks and paraphernalia, installation of black sacks between tanks to minimize contamination, and use of UV-sterilized seawater. He also shared the larval rearing protocol being done at SEAFDEC/AQD which stopped common viruses from affecting shrimps.

Mudworm culture

Associate Researcher Mary Anne Mandario, on the other hand, presented the hatchery set-up and operation of mudworm at SEAFDEC/

AQD and introduced to fish farmers the importance of mudworm *Marphysa* sp. in aquaculture and why there is a need to culture this marine annelid locally known as *ulod-ulod*.

“Mudworm has many uses in aquaculture. It is used in bioremediation and environmental monitoring studies, used as feed for shrimp broodstock to improve reproductive performance and is a good alternative protein and lipid source in crustacean diets,” said Ms. Mandario who further explained that depletion of the natural population of mudworms and the destruction of their natural habitat can also be prevented.

The natural habitats of mudworm are mangrove mudflats and brackish water ponds but there is a need to culture it to have a stable supply for aquaculture use. Moreover, cultured mudworm have improved nutrient quality and are pathogen-free.



A participant from the private sector consults SEAFDEC/AQD experts during the Aquaculture Clinic. PHOTO BY JM DE LA CRUZ

Mangrove crab hatchery

Lastly, Ms. Joana Joy Huervana, associate researcher, talked about the hatchery technology for mangrove crab and explained that among the advantages of hatchery-reared crabs is that sizes of crablets are similar and are available throughout the year as well as the growth of hatchery-reared crabs being comparable to wild crabs.

Ms. Huervana also shared to the fish farmers the feeding and water management

protocol for larval rearing practiced at SEAFDEC/AQD and emphasized that to increase the supply of crablets, the private sector should invest in a crab hatchery especially in areas where the crabs are cultured.

Aside from the lectures, the participants were also able to consult SEAFDEC/AQD experts during the Aquaculture Clinic regarding different problems and other concerns that they encountered in their farms. [a](#)

—RH LEDESMA

New publications launched

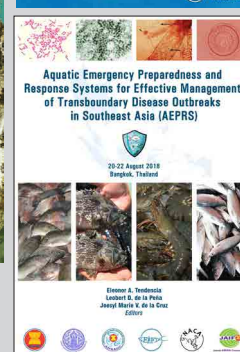
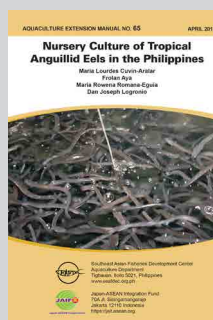
AS PART of SEAFDEC/AQD's anniversary tradition, a new set of publications were launched and given to stakeholder representatives last 11 July 2019 at AQD's Multi-Purpose Hall.

Included in the set is the 65th aquaculture extension manual on Nursery Culture of Tropical Anguillid Eels in the Philippines authored by Dr. Maria Lourdes Aralar, Dr. Frolan Aya, Dr. Maria Rowena Romana-Eguia, and Mr. Dan Joseph Logronio. It is a 37-page manual that documents on-farm practices of eight anguillid farms surveyed in the Philippines as well as species identification and health management approaches.

The set also includes the Proceedings for Aquatic Emergency Preparedness and Response Systems (AEPRS) for Effective Management of Transboundary Disease Outbreaks in Southeast Asia. It is a product of a Regional Technical Consultation with the same title. It compiled reports from Southeast Asian countries including Japan on aquatic animal health management together with the summary of issues and recommendations on AEPRS.

Also launched during the event was AQD Highlights 2018 and a commodity brochure on sea cucumber hatchery and nursery. [a](#)

—JM DE LA CRUZ



Digital library box turned over to SUCs anew



Representatives from the 14 universities and colleges receive the IAMSLIC Digital Fisheries Library Box from SEAFDEC/AQD last 11 July 2019 at AQD's Tigbauan Main Station in Iloilo. PHOTO BY JM DE LA CRUZ

ANOTHER group of 14 state universities and colleges (SUCs) around the country received the second batch of the International Association of Aquatic and Marine Science Libraries and Information Center (IAMSLIC) Digital Fisheries Libraries from SEAFDEC/AQD's Library and Databanking Services last 11

July 2019 at AQD's Multi-Purpose Hall in Tigbauan, Iloilo.

These digital library boxes contained over 26,000 publications that may be freely accessed using laptops and smartphones even without internet connection.

The recipients for this year are Romblon State University-Sta. Fe, Mindanao State

University -Buug, Central Bicol State University of Agriculture-Calabanga, Cebu Technological University-Moalboal, Ilocos Sur Polytechnic State College-Sta. Maria, Carlos Hilado Memorial State College – Binalbagan, Catanduanes State University-Virac, Davao del Norte State College-Panabo, Partido State

University-Sagnay, Sorsogon State College-Magallanes, Southern Leyte State University-Bontoc, Southern Luzon State University-Tagkawayan, Southern Philippine Agri-Business and Marine and Aquatic School of Technology, and University of Rizal System - Cardona Campus. [a](#)

— JM DELA CRUZ

AQD scientist reports on Philippine eel research at int'l symposium



Dr. Maria Rowena Eguia (leftmost) receives a token from the Indonesian Society of Tropical Eels with other presenters during the Third International Symposium on the Tropical Eel Genus *Anguilla* held from 1 to 3 August 2019 in Manado, Indonesia. PHOTO COURTESY OF MRR EGUIA

MANADO, Indonesia – Dr. Maria Rowena Eguia, a scientist of SEAFDEC/AQD, gave a presentation on past and present research on Philippine anguillid eels as an invited speaker during the Third International Symposium on the Tropical Eel Genus *Anguilla* (ISTEGA) last 1 to 3 August 2019.

Apart from research studies, Dr. Eguia also presented important information on eels including regulations, conservation, and management initiatives being done by the Philippine government.

Dr. Isao Koya, assistant project manager of Japanese Trust Fund programs being conducted at SEAFDEC

Secretariat in Bangkok, was also present during the symposium. He reported the results of the recently concluded project on “Enhancing Sustainable Utilization and Management of Tropical Anguillid Eel Resources in Southeast Asia,” which also involved Dr. Eguia and other AQD scientists, Dr. Maria Lourdes Aralar, Dr. Frolan Aya, and Deputy Chief Dr. Koh-ichiro Mori.

The symposium, organized by the Indonesian Society for Tropical Eels, was conducted to serve as a venue of discussion about the science, conservation and management of anguillid eel species around the world. [a](#)

— JM DELA CRUZ

Immunized sea bass breeders produce disease-free offspring



Sea bass (*Lates calcarifer*). PHOTO FROM AQD ARCHIVE

KNOWN for its white flaky flesh and mild flavor, Asian sea bass is one of the sought-after fish in fine dining restaurants.

Lates calcarifer, locally known as *bulgan* or *apahap*, is a high-value food fish that is economically important in the tropical and sub-tropical regions of Asia and the Pacific. Due to its economic importance and being a hardy species, sea bass is an ideal candidate for aquaculture.

However, this species is not exempted from the disease called viral nervous necrosis (VNN) that affects both wild and farmed fish. Viral nervous necrosis is considered as one of the most devastating diseases in a variety of cultured marine fish, occurring mostly during the larval and juvenile stages of a fish.

Once infected, the fish show symptoms such as a bloated stomach due to the enlargement of the swimbladder, change in color, abnormal swimming behavior, and loss of appetite.

Outbreaks of VNN in the larval stages occur through transmission of the nervous necrosis virus (NNV) from the breeders to their offspring. This remains as a

major concern during seed production of Asian sea bass.

But the good news is, SEAFDEC/AQD scientist Dr. Rolando Pakingking Jr. and his team developed an immunization regimen to produce NNV-specific-free sea bass breeders. The team worked on this research project for five years to assess the feasibility of the immunization regimen in maintaining NNV-specific-free sea bass breeders reared in land-based tanks.

The regimen is detailed in Dr. Pakingking's paper "Immunization regimen in Asian sea bass (*Lates calcarifer*) broodfish: A practical strategy to control vertical transmission of nervous necrosis virus during seed production," which was published in volume 36 issue no. 33 of the journal *Vaccine*. The paper, which he co-authored with Dr. Evelyn Grace de Jesus-Ayson, Ms. Ofelia Reyes and Mr. Norwell Brian Bautista, was selected as the 2019 Dr. Elvira O. Tan Award for Outstanding Published Paper in Aquatic Science Category by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development.

How was it done?

The immunization regimen was done by injecting formalin-inactivated nervous necrosis virus at the abdominal cavity of anesthetized sea bass juveniles. Booster immunization was then carried out annually to maintain the level of NNV-neutralizing antibodies of the fish samples. The sea bass samples were given booster immunization until the fourth year of the experiment wherein they are already sexually mature to spawn.

Induced spawning of sexually mature sea bass was then conducted successively to test the efficacy of the vaccine-induced maternal antibodies in preventing the transmission of NNV from the breeders to its offspring.

Immunized breeders produce NNV-free sea bass juveniles

In the induced spawning experiment done by Dr. Pakingking and his team at SEAFDEC/AQD's hatchery facility, NNV was not detected in the milts and eggs of immunized sea bass as well as the spawned eggs. The juveniles produced from these

spawned eggs also remained NNV free.

On the other hand, unimmunized sea bass breeders and their spawned eggs were found positive for NNV. Moreover, rearing of larvae from unimmunized sea bass was discontinued since they remained NNV positive and some batches of postlarvae died due to NNV infection.

Experiments done in the succeeding years of this Government of Japan Trust Fund and SEAFDEC/AQD-funded research project also showed the same trend wherein spawned eggs coming from immunized breeders were free from nervous necrosis virus and those from unimmunized breeders were NNV positive.

Immunization coupled with biosecurity keep NNV away

The immunization of sea bass breeders helped in preventing the transfer of nervous necrosis virus to their offspring but for the offspring to remain NNV-free, they should also be cultured in a biosecure facility.

As explained in the paper of Dr. Pakingking and his co-authors, the protection given by the maternal antibodies to the offspring is transient and not heritable. Thus, it is advised to keep the hatchery facility NNV-free until the offspring are ready to be immunized via injection in their abdominal cavity. The offspring are usually ready for immunization at the juvenile stage having a mean body weight of 3 to 5 grams. **a**

—RH LEDESMA

AQD 46th Anniversary Celebration

Santiago says experts must work together, brainstorm for the development of aquaculture

DR. ALFREDO Santiago called on SEAFDEC/AQD researchers to go beyond their “box of expertise,” work together, and pool their ideas to further the development of aquaculture.

In his keynote message during the SEAFDEC/AQD 46th Anniversary Program on 12 July 2019, Dr. Santiago noted that SEAFDEC/AQD has all the expertise to support the generation of quality and sustainable aquaculture technologies but emphasized that experts must work as a team.

“Brainstorm and apply the interdisciplinary approach in conducting research,” said Dr. Santiago who was also a senior researcher prior to becoming chief of SEAFDEC/AQD from January 1983 to April 1986.

Dr. Santiago also stressed the importance of keeping abreast of how aquaculture is developing around the world



Dr. Alfredo Santiago delivers his keynote message during the SEAFDEC/AQD 46th Anniversary Program on 12 July 2019 at the Multi-Purpose Hall. PHOTO BY JM DE LA CRUZ

while being mindful that what might be sustainable in one area might not be sustainable in another.

“With the advances in information technology, everyone should be aware of what is going on in other places, countries, and find out techniques that can


be improved and adapted to existing aquaculture technologies,” he said, addressing the SEAFDEC/AQD community assembled at the Multi-Purpose Hall.

The former SEAFDEC/AQD Chief also said that research outputs must reach the fish farmers and fish

culturists through education, training and extension.

“Cooperation with the private sector, government agencies, and other international agencies must also be pursued,” he said.

Finally, he challenged the researchers and scientists to “make the SEAFDEC Aquaculture Department a consistent leading agency in the further development of sustainable aquaculture technologies that address food security.”

In the early years of SEAFDEC/AQD, Dr. Santiago was instrumental in the establishment of tiger shrimp maturation pens in Guimaras which eventually became the Igang Marine Station. This paved the way for the completion of the tiger shrimp life cycle in captivity, the first major breakthrough of SEAFDEC/AQD which catapulted the institution to international prominence. 

— RD DIANALA



Chief Dan Baliao (left) shows his appreciation to Former Chief Dr. Alfredo Santiago after his inspirational message. Photo by JM DE LA CRUZ

After 33 years at AQD, Dr. Aralar pins hopes on younger generation



Dr. Maria Lourdes Aralar (third from right) together with fellow 2019 retiree Ms. Maria Rovilla Luhan, an associate scientist, (second from right) were awarded by AQD Executive Committee (left to right) Dr. Leobert de la Peña, Ms. Amelita Subosa, Chief Dan Baliao, and Deputy Chief Dr. Koh-ichiro Mori. Not in photo are other retirees including Manila Office head Ms. Anna Ortiz, Research Aide Mr. Daniel Gipulan, Technician Mr. Federico Reyes, and Senior Technician Mr. Remegio Sayno. **PHOTO BY RH LEDESMA**

DR. MARIA Lourdes Aralar, a scientist of the SEAFDEC Aquaculture Department (AQD) for over 33 years, dedicated her retirement speech to the young members of the staff last 12 July 2019 during the 46th Anniversary Program at AQD's Tigbauan Main Station in Iloilo.

"We hope that you take over the vision and the passion to forge a new direction for AQD; keeping it relevant and adaptive to the needs of the industry," said Dr. Aralar who, during her time in AQD, also earned her doctorate in Agricultural Science, magna cum laude, from Hohenheim University in Stuttgart, Germany.

She led one of AQD's major thematic programs called Maintaining Environmental Integrity through Responsible Aquaculture and headed AQD's Binangonan

Freshwater Station (BFS) in Rizal.

In her speech, Dr. Aralar chronicled the difficult situations she faced during her stint, not only in research but also with legal matters. She then happily welcomed the new BFS station head, Dr. Frolan Aya.

"[Dr. Aya] will bring new blood to the station, new funding for research, and will steer the station to greater heights," she said.

She continued to express her immense gratitude to the Department in being a nurturing venue for her personal and professional growth.

"Through my work at AQD, I have been given the opportunity to collaborate with the best scientists in the field – both local and international," said Dr. Aralar.

Despite her commendable achievements in the international arena, she still

thinks of people close to home and mentioned the great contribution of Mr. Federico Reyes, a research technician and also a 2019 retiree, who was assigned to work with her since her first day at the department.

Dr. Aralar shared how the AQD and the process of information sharing have

changed throughout the years — from receiving scientific updates through snail mail to having the ease of accessing new research via online journals. With these new technologies, she encouraged the younger generation to be more vigilant.

"Unfortunately, such ease also made disinformation so

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Dr. Maria Lourdes Aralar gives her speech on behalf of all retirees during AQD's 46th Anniversary Program last 12 July 2019. **PHOTO BY RH LEDESMA**



SEAFDEC/AQD recognizes the loyalty of its staff who have offered decades worth of service to the Department. This year's awardees are (right to left) Associate Scientist Dr. Shelah Mae Ursua [20 years], Associate Scientist Ms. Maria Rovilla Luhan [35 years], Scientist Dr. Eleonor Tendencia [35 years], Senior Technician Mr. Florito Pudadera [25 years], Driver Mr. Nestor de la Cruz [25 years], Senior Information Assistant Mr. Rosenio Pagador [30 years], Researcher Ms. Gregoria Pagador [30 years], Administrative Officer III Engr. Zaldy Suriaga [30 years], and Financial Assistant III Ms. Nanette Bantillo [30 years]. **PHOTO BY RH LEDESMA**

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much easier to prey on weak and vulnerable minds. As members of a research and scientific institution, let us be critical of the information glut and determine the chaff from the grain because misinformation creates chaos worldwide," said Dr. Aralar.

In her speech, she also mentioned how AQD, through its medical benefits, helped her with a condition she experienced in the past and shared how important the annual medical check-up is for early detection and prevention of possible illnesses.

"I pray that AQD will continue to be more proactive in taking care of their staff for it is only when the people are well taken care of, in terms of compensation, productive working environment, respectful interaction between bosses and subordinates, that AQD can prosper," she shared.

AQD was also the venue for one of the most significant moments of Dr. Aralar's life and that is meeting her husband, Engr. Emiliano Aralar, a former AQD senior technical assistant with whom she has three children and a grandson.

"In AQD, I met my OTP [one true pair]," she said, to the amusement of the audience. **a**

—JM DE LA CRUZ



AQD staff, who were recognized in their respective fields and gave honor to the department, receive special awards from the Department. The following were recognized (right to left): Researcher Mr. Peter Palma for winning the Best Research Presentation Award during the 12th Asian Fisheries and Aquaculture Forum; Information Specialist II and Library head Mr. Stephen Alayon for his award during the Gawad Parangal sa Natatanging Laybraryan (Visayas); Scientist and Binangonan Freshwater Station head Dr. Frolan Aya for being awarded as *Outstanding Young Scientist*; and Scientist Dr. Rolando Pakingking, Jr. for being awarded the *Dr. Elvira O. Tan Award for Outstanding Published Paper in Aquatic Science Category* together with Scientist Dr. Evelyn Grace Ayson, Former Researcher Ms. Ofelia Reyes, and Former Microscopist Mr. Norwell Brian Bautista. Not in photo is Former Scientist Dr. Emilia Quintio who was awarded as the *2019 Outstanding Professional of the Year in the Field of Fisheries*. **PHOTO BY RH LEDESMA**

A special service award was given to AQD's Company Dentist Ms. Therese Sumbito. Doc Bebet, as fondly called by her colleagues, served the department for 28 years. **PHOTO BY RH LEDESMA**



Baliao: 'We still have a lot to do'



Chief Dan Baliao delivers his state of the AQD speech during the 46th Anniversary Program at the AQD Multi-Purpose Hall in Tigbauan, Iloilo last 12 July 2019. PHOTO BY JM DE LA CRUZ

AFTER 46 years since SEAFDEC/AQD was founded, Chief Dan Baliao says the Department still has “a lot to do” towards increasing sustainable aquaculture production.

The Department Chief said this as he reported on the thrusts and activities of the Department from his banner program “*Oplan Balik Sugpo*” to the development of low-cost aquafeeds, intensified techno-transfer activities, addressing milkfish fry scarcity and development of human resources in aquaculture.

“Although shrimp culture will be given priority, in the project plan we will continue to undertake the culture of other coastal, marine, brackishwater, and freshwater species, especially those that help address the problems of poverty and provide sustainable livelihoods for fisherfolks,” he said.

Oplan Balik Sugpo

The Chief shared that while the Department already has the capability

to rapidly detect shrimp pathogens and has completed the reconfiguration of the Dumangas Brackishwater Station, shrimp broodstock selection is still being improved.

“The shrimp broodstock development team is also now into the production of good quality fry. They are now improving broodstock selection to refine quarantine and biosecurity including biosecure production of natural food organisms,” he said.

He added that new training courses will also be conducted with emphasis on shrimp biosecure hatchery operations and grow-out operations for tiger shrimp and other shrimp species.

Low-cost feeds

“The nutrition and feed development team on the other hand is developing low-cost diet to reduce production cost by 40% compared to the commercial feeds,” he added, referring to the substitution or possible total replacement of fish meal in feeds with alternative ingredients.

Baliao also reported that in anticipation of a nationwide field-testing of the low-cost feeds, the Department is increasing its feed production capacity by building a new feed mill with the support of the Philippine Department of Agriculture’s Bureau of Agricultural Research.

Intensified techno-transfer

“Over the last one year and eight months since I assumed office, we are now again intensifying technology-transfer activities in partnership with other agencies,” he added, while stressing that as a regional organization, its priority partnership should be the lead fisheries agencies of SEAFDEC member countries, particularly the Bureau of Fisheries and Aquatic Resources (BFAR) in the Philippines.

The Chief also mentioned mangrove crab trainings in Catanduanes and Tacloban in partnership with BFAR and a series of trainings for new staff of BFAR Region 6.

“The collaboration will enable the two organizations to pool resources and technical expertise to revitalize the fishery and aquatic resources of the country. It will also be instrumental in achieving a common goal – increase fish production,” he said.

Milkfish fry sufficiency

Also in support of BFAR, the Chief said the Department has been conducting extensive feasibility studies of proposed multi-species hatchery sites around the Philippines to ensure the success of the hatcheries that will be established.

“The bangus fry sufficiency program can be undertaken through this platform in a scheme where the government will build central hatcheries and satellite hatcheries to serve milkfish fingerlings to grow-out producers.”

In addition, he said SEAFDEC/AQD will also assist BFAR by augmenting technical manpower and providing training to help the Philippines produce at least 85% of industry requirements.

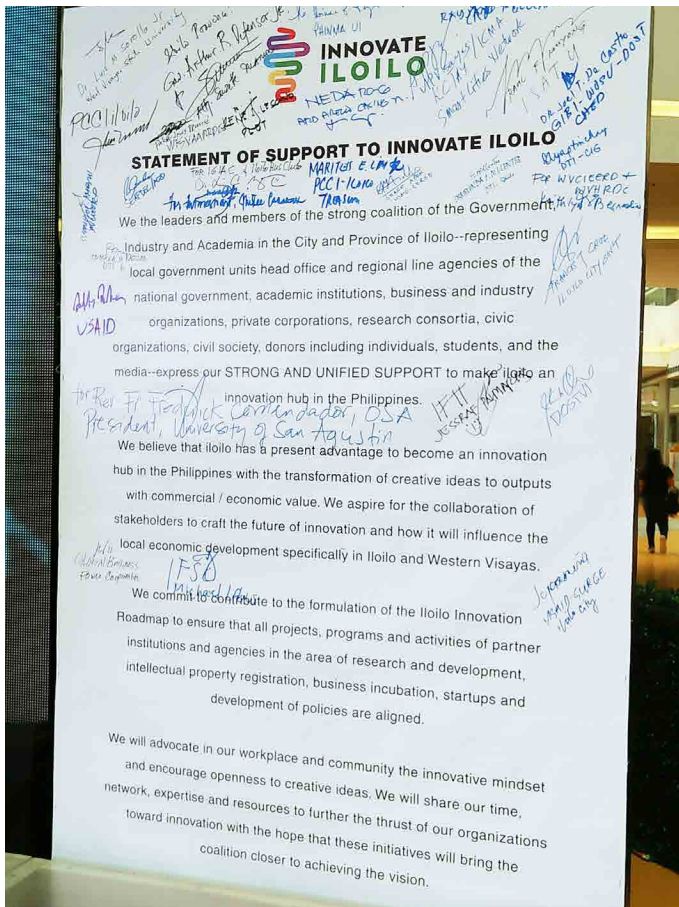
‘Daunting challenge’

“Together let us face a more daunting challenge to meet the expectation of not only the Filipino people but also those of our Southeast Asian brothers,” Baliao said to the SEAFDEC/AQD staff and guests gathered at the Multi-Purpose Hall last 12 July 2019 for the Department’s 46th Anniversary Program.

“We still have a lot to do. The winds of change will blow across our paths and we may be confronted with seemingly insurmountable problems. But, together let us face it with enthusiasm and help one another to overcome it.”

— RD DIANALA

Support to make Iloilo an 'innovation hub' inked



The statement of support for Innovate Iloilo signed during the launch of the movement on 13 August 2019 at SM City Iloilo in Iloilo City.
PHOTO BY RD DIANALA

ILOILO CITY – Along with other organizations from the public and private sector, SEAFDEC/AQD signed a statement of support to a movement to make Iloilo Province an “innovation hub” in the Philippines.

The movement, dubbed Innovate Iloilo, involves Iloilo-based local government units, regional line agencies of the Philippine government, academic institutions, business and industry organizations, private corporations, research consortia, civic organizations, civil society and the media.

The statement of support, signed during the launch of Innovate Iloilo at SM City Iloilo in Iloilo City last 13 August 2019, says signatories “commit to contribute to the formulation of the Iloilo Innovation Roadmap to ensure that all projects, programs and activities of partner institutions and agencies

in the area of research and development, intellectual property registration, business incubation, startups and development of policies are aligned.”

Signatories also committed to advocate the “innovative mindset and encourage openness to creative ideas.”

Workshops towards the Innovate Iloilo Roadmap have been held on 10 and 31 May 2019 and another more recently on 14 August. Information Specialist Rex Delsar Dianala represented SEAFDEC/AQD in the workshops with Scientist Dr. Eleonor Tendencia also joining in the August workshop.

SEAFDEC/AQD is the team leader in workshop discussions for “Globally Robust R&D Centers” where local R&D consortia and the Department of Science and Technology are also assigned. [a](#)

— RD DIANALA

SEAFDEC/AQD training course tagged as beginner-friendly

A PARTICIPANT in the Training Course on Marine Fish Hatchery, speaking in behalf of the rest of the trainees, found the learning experience to be beginner-friendly.

Ms. Janine Camahalan, a business owner from General Santos City, attended the course without prior background in aquaculture. During the closing program, she shared how easily she learned the techniques in marine fish hatchery despite being a beginner.

“This is the only time I get to learn the basics which are really helpful in the business I currently manage,” she said.

Training courses in AQD are designed to combine

both lecture and practical exercises which lead to the development of both mental and muscle memory of trainees. In this course, lectures covered broodstock management, larval rearing, among others. The trainees then worked with SEAFDEC/AQD staff in extensive hatchery work including egg collection and broodstock sampling.

“Everything that I got from this training course is of value and the rest of my fellow trainees would surely agree with me,” Ms. Camahalan added.

Eight participants from different parts of the Philippines attended the 37-day Training Course on

Marine Fish Hatchery from 24 June to 30 July 2019 held at SEAFDEC/AQD's Tigbauan Main Station. Four of the participants from government

agencies and the academe were supported through the Government of Japan-Trust Fund training fellowship. [a](#)

— JM DE LA CRUZ



Trainees execute cannulation biopsy of grouper broodstock at one of the hatcheries of SEAFDEC/AQD's Tigbauan Main Station last 3 July 2019.

PHOTO COURTESY OF TRAINING SECTION

AQD conducts two BFAR-sponsored training course



Ms. Joana Joy Huervana, an associate researcher and mangrove crab expert from AQD, demonstrates to participants from Catanduanes how to identify species and sex of crabs last 6 August 2019 at AQD's Tigbauan Main Station. **PHOTO BY TRAINING SECTION**

DUE to the commodity's continuous high demand in the market, two Bureau of Fisheries and Aquatic Resources (BFAR)-sponsored training courses on mangrove crab culture were conducted at SEAFDEC/AQD last 15 to 29 July and 5 to 12 August 2019.

BFAR Regional Office 8 sponsored 12 participants including aquaculture technicians, government staff, and investors from the province to learn about the nursery, hatchery, and grow-out of mangrove crab. In Eastern Visayas, farming mangrove crab in ponds is known to be one of the main sources of livelihood.

"Kahit galing na kami sa fisheries sector, ang training

na ito ay nagbigay sa amin ng additional technical knowledge sa pag-culture ng [mangrove] crabs (Even with our experience working for the fisheries sector, this training still gave us additional technical knowledge on mangrove crab culture)," said Mr. Roger Tuba, an aquaculture technician from BFAR Regional Office 8, on behalf of the trainees.

On the other hand, the province of Catanduanes is aiming to be the country's mangrove crab capital. With this, BFAR Central Office sponsored 14 participants to attend the training course on nursery and grow-out operations including crab fattening methods.

This is part of the ongoing partnership between the department and BFAR wherein AQD will conduct surveys and training courses towards establishing

mangrove crab seed banks and production farms in the province.

Both training courses included lectures from a wide range of topics from mangrove crab biology and identification to feed formulation, preparation, and management. Participants also experienced hands-on exercises including sorting and sampling, feeding, and harvesting. All sessions were handled by AQD's mangrove crab experts.

"Maraming salamat sa mga instructors namin na tinulungan kami na magkaroon ng sapat na knowledge para may ma-ishare kami pagbalik sa aming mga lugar (We would like to thank our instructors who helped us gain enough knowledge which we can share when we go back home)," he said. **a**

—JM DE LA CRUZ



Trainees from BFAR Region 8 identify and sort harvested crabs during a practical session at AQD's Dumangas Brackishwater Station last 25 July 2019. **PHOTO BY TRAINING SECTION**



aqd matters

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AQUAWEEK 2019: SciArt Contests



STUDENTS and teachers from Panay Island joined FishWorld's annual Sci-Art AquaweeK last 29 July to 2 August 2019 at SEAFDEC/AQD's Tigbauan Main Station in Iloilo.

The series of science and art contests revolved around the United Nation's Sustainable Development Agenda, particularly the SDG 14 - Life Below Water: *Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.* Here are the official list of winners.

College

On-the-spot Poster Making Contest

Prize	Names	School
1st	Heiro G. Granja	Iloilo Science and Technology University
2nd	Renwil Jake S. Portodo	
3rd	Aliza M. del Pilar	

High School

Essay Writing Contest

Prize	Names	School
1st	Fritz Elli D. Gallo Coach: Aspen Dolene C. Martinez	Hua Siong College of Iloilo-Ledesco Campus
2nd	Chrisnae Abonador Coach: Anne Gelli L. Lauron	Leganes National High School
3rd	Rezza Azad Coach: Anne Gelli L. Lauron	Leganes National High School

Photojournalism Contest

Prize	Names	School
1st	Reuben Palma John Manoella Nillos Coach: Vicente P. Celestial	Pavia National High School
2nd	Zephany Duhina Alana Joy Jolo Coach: Randolph A. Dineros	Dumangas National High School
3rd	Aska B. Abada Janice A. Tonogbanua Coach: Kate Clare E. Payda	Ramon Avanceña National High School

Elementary

Nutrition and Aquaculture Quiz

Prize	Names	School
1st	Anne Michelle A. Payunan Coach: Jasmine T. Delijo	Arevalo Elementary School
2nd	Jhomel A. Aquinto Coach: Jessica S. Sequito	Santa Barbara Central Elementary School
3rd	Joshua Isaac Isiah F. Narido Coach: Abigail P. Peñaflorida	Solomon Integrated School de Iloilo

Write and Draw a Children's Story

Prize	Names	School
1st	Charven Elizabeth Ubalde Jorel Galfo Coach: Cinderela A. Sotaridona	Hibao-an Elementary School
2nd	Keno Jon A. Guadalupe Brent Harvey G. Cabillora Coach: Laden Jane P. Caalem	West Visayas State University - Integrated Laboratory School
3rd	Daniel G. Herradura Kate Benedict Jaudines Coach: Martin A. Pamillaran	Leganes Central Elementary School

Sayawit

Prize	Names	School
1st	Lorice M. Cadeleña Mary Angela A. Carmen Wayne Glaiza G. Juson Princess Joy T. Novis Coaches: Cinderela A. Sotaridona Rogelio S. Cautivar	Hibao-an Elementary School





BasurArt Contest

Prize	Names	School
1st	Vince Jade Fortuna Joeren Pahilagao John Christdel Causing Coach: Mary Ann L. Navarra	Leganes National High School
2nd	Hannah Marie Celso Clarence John Dimson Angel Hope Drilon Coach: Celerino Deoduco, Jr.	Dumangas National High School
3rd	Karl Antonie Samina Joseph Clyde Sularte Rov Webnel Jalbuna Coach: Ecel T. Resano	Pavia National High School

On the Spot- Poster Making Contest

Prize	Names	School
1st	Nicole Sanchez Gange Coach: Mary Joy B. Balandra	Iloilo National High School
2nd	Jhun Dave Libona Coach: Oscar L. Tupong, Jr.	Cordova National High School
3rd	Janiel Maryani Yorac Coach: Paulene Therese S. Del Rosario	Hua Siong College of Iloilo - Main Campus

Stage Play Contest

Prize	Names	School
1st	Nicole Marie G. Dela Peña Catherine T. Alasagas Mica Faryl U. Terania Coach: Jhon Ray T. Gargarita Ryan T. Torremoro	Tigbauan National High School
2nd	Mareshah Pardilla Jalandoni John Mark Souribio Montinola Karylle Louise Estante Demiar Coach: Rey Seith A. Buyco Ma. Leorica A. Tamaño	Iloilo National High School
3rd	Ayumi Cassandra S. Zerrudo Kyle Emil Jalandoon Xystina Marie Patopaten Coach: Kevin Jurada April Rose G. Chua	Ramon Avanceña National High School

Seafood Dish Contest

Prize	Names	School
1st	Voughn Jordan G. Presquito Clehyr U. Meioby Gabrielle Shane Visto Coach: Anghelou A. Saban	Hua Siong College of Iloilo-Ledesco Campus
2nd	Janna Rose Ong May Joy Ong Skye Mae Hipolito Coach: Marjoe Ann Soliva	Hua Siong College of Iloilo-Main Campus
3rd	Kyla Marie Magallanes Angel Mae Alisbo Princess Shamel Defante Coach: Francis F. Gonzaga	Guimbal National High School

Media and Information Literacy Seminar Contest

Prize	Names	School
1st	Shane Catherine T. Besares	Ramon Avanceña National High School
2nd	Thomas Jerald A. Ea	Colegio del Sagrado Corazon de Jesus
3rd	Apple D. Funtanilla	Iloilo National High School

Aquaweeek 2019 exhibit @ SM City Iloilo



ILOILO CITY - SEAFDEC/AQD showcased artworks, produced by pupils and students who participated during the Aquaweeek Sci-Art Contests, in an exhibit at SM City Iloilo from 16 to 19 August 2019.

Over 3,000 people visited the exhibit to see poster paintings, handiworks made of marine debris, and scale models of AQD's priority aquaculture commodities. **PHOTOS BY RD DIANALA**

USEC Gongona visits AQD

RETIRED Commodore Eduardo Gongona, Undersecretary of Fisheries for Department of Agriculture and Director of the Bureau of Fisheries and Aquatic Resources (BFAR), visited SEAFDEC/AQD's Tigbauan Main Station last 1 August 2019.

Director Gongona and AQD Chief Dan Baliao had a meeting on the status of the collaborative project between AQD and BFAR to establish legislated multi-species hatcheries around the country.

Interested in learning more about AQD's activities, Director Gongona toured the facilities including the Laboratory Facilities for Advanced Aquaculture Technologies and the Integrated Fish Broodstock Hatchery Complex. [a](#)

—JM DE LA CRUZ



[ABOVE] Director Gongona (right) and Chief Baliao discuss the progress of the SEAFDEC-BFAR collaborative projects. [LEFT] Director Gongona observes activities at AQD laboratories including the Electron Microscopy Laboratory. PHOTO BY JM DE LA CRUZ

Gov't officials from India visit AQD for study tour



Mr. Michael Tesorero, technical assistant at SEAFDEC/AQD, shows the commodities cultured in the cages at the Igang Marine Station. PHOTO COURTESY OF TRAINING SECTION

TO GAIN insight on aquaculture, 13 officials of the Department of Fisheries in Tamil Nadu, India visited the facilities of SEAFDEC/AQD

in Binangonan, Rizal and Tigbauan, Iloilo.

The study tour of the Indian officials started at the Binangonan Freshwater

Station (BFS) on 29 July 2019 where they were oriented about the aquaculture technologies being studied at the Station. They also

went around BFS to see its facilities. They were also able to see the fish pens and cages at Laguna de Bay and visited the National Inland Fisheries Technology Center in Tanay, Rizal. Moreover, they also went to a private eel farm in Antipolo, Rizal on 30 July 2019.

From 31 July to 2 August 2019, the Indian officials visited the research facilities at SEAFDEC/AQD's Tigbauan Main Station and Dumangas Brackishwater Station in Iloilo and Igang Marine Station in Guimaras.

In addition, an overview of the aquaculture technologies available in these stations as well as the training and information activities of the institution were also explained to the Indian officials by SEAFDEC/AQD officers. [a](#)

—RH LEDESMA