

# SEAFDEC AQD Matters

Newsletter of the SEAFDEC Aquaculture Department (AQD), Tigbauan, Iloilo, Philippines

## Inauguration and Turnover of a Mud Crab Hatchery to the LGU of Guindulman, Bohol

**T**he problem of the lack of crablets for farming is being addressed by the National Mud Crab Science and Technology Program, which is being funded by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (PCAARRD-DOST), through the construction of prototype hatcheries to produce crablets in areas where there are no reliable source of wild seedstock like the province of Bohol. There are 14 projects under this Program and one project is the *Pilot Demonstration of a Commercial-Scale Model Mud Crab Hatchery in Bohol* headed by SEAFDEC/AQD scientist Dr. Emilia Qunitio. A former staff of SEAFDEC/AQD, Engr. Reynaldo Tenedero, helped in the design and managed the construction of the hatchery that was started in February 2014 and completed in June 2014. The hatchery is designed not only for the production of crablets of mud crab but for juveniles of other aquaculture commodities, as well. The total capacity of the hatchery is 151 tons (21 tons of fiberglass tanks



Turnover of the hatchery by SEAFDEC/AQD Chief Dr. Felix Ayson (leftmost) and PCAARRD-DOST Deputy Executive Director Engr. Maria Teresa de Guzman (2nd from left) to the LGU of Guindulman represented by the Mayor, Dr. Fe Piezas (4th from left)



Blessing of the natural food production area (left) and larval rearing area (right) of the hatchery facility

& 5 tons concrete tanks for larval rearing, 5 tons concrete tanks for broodstock, 100 and 20 tons of canvas tanks for natural food production and nursery phase of rearing, respectively). It is capable of producing up to 40,000 crab instar 1 per run. The hatchery operation started last year and two batches of crablets were already produced. The hatchery can supply crablets to farms in Bohol as well as in the nearby provinces of Cebu, Negros Oriental and Leyte. The success that will be

demonstrated in this hatchery will hopefully inspire other municipalities to duplicate this project.

This is the first mud crab hatchery constructed under the funding of PCAARRD-DOST that is being turned over to a local government unit in the Municipality of Guindulman. The ceremony was held last May 28, 2015 in Guindulman, Samar. In attendance were Dr. Fe Piezas, mayor of the province; provincial, municipal, barangay officials and staff.

Others present to witness the event were Engr. Maria Teresa de Guzman, Deputy Executive Director and Dr. Adelaida Calpe, Mud Crab ISP manager, both of PCAARRD-DOST. SEAFDEC/AQD was represented by the Chief, Dr. Felix Ayson, who gave one of the messages; Dr. Emilia Qunitio, who gave the background of the project; Dr. Fe Estepa, the head of the Technology Verification and Demonstration Division; and Ms. Charmi Fernandez, head of Internal Audit Unit of SEAFDEC/AQD.

- ET QUNITIO

# AQUATECH opens new window of opportunity for SEAFDEC/AQD

The 6th Aquaculture Expo and Convention (AQUATECH 2015) is one of the venues where SEAFDEC/AQD increases its visibility to the public. It was through AQUATECH 2015 that Senator Cynthia Villar, chair of the Senate Committee on Agriculture and Food, knew about SEAFDEC/AQD. She was very interested on SEAFDEC/AQD's training programs and publications; and even bought most of the publications on sale.

SEAFDEC/AQD scientists Dr. Ma. Lourdes Aralar and Dr. Nerissa Salayo were also given an opportunity to discuss with Senator Villar some issues on fisheries and aquaculture and invited her to join SEAFDEC/AQD's anniversary activities.

AQUATECH was also a good venue for SEAFDEC/AQD scientists to share their knowledge and expertise. Dr. Aralar, Dr. Salayo, and Dr. Maria Rowena Eguia talked on *Emerging Species: Giant Freshwater Prawn*, *Abalone Stock Enhancement: an Emerging Export Commodity and Economically-viable Production Technique*, and *Addressing Challenges in Sustainable Fish Production through Aquaculture Genetics*, respectively.

SEAFDEC/AQD was also able to disseminate its science-based aquaculture technologies and services to about 130 guests who visited its booth.

AQUATECH was held at Summit Ridge Hotel in Tagaytay City, Philippines on 28-29 May 2015.

- RH LEDESMA



Senator Cynthia Villar visits SEAFDEC/AQD booth



Senator Villar (leftmost) with Dr. Aralar and Dr. Salayo (4th-5th from left) and other participants of AQUATECH 2015



(L-R) SEAFDEC/AQD scientists Dr. Ma. Lourdes Aralar, Dr. Nerissa Salayo and Dr. Maria Rowena Eguia during their talk at AQUATECH 2015

## SEAFDEC/AQD presents paper at ISGA XII in Spain

SEAFDEC/AQD scientist Dr. Maria Rowena Eguia presented a poster paper on *Genetic assessment of Philippine milkfish (Chanos chanos) stocks based on novel microsatellites for marker-aided broodstock management* during the International Symposium of Genetics in Aquaculture XII (ISGA XII) in the University of Santiago de Compostela, Spain last 21-27 June 2015.

The conference's sessions have presentations by invited experts on various topics like (a) breeding programs, (b) environmental risks, (c) genomes and genetic architecture, (d) genomic selection and marker assisted selection, (e) functional genomics, (f) sex control and (g) biotechnology. The oral presentations were mostly about

ongoing genetics projects/ programs involving several agencies. A total of 181 poster presentations were viewed, including Dr. Eguia's, during the conference.

Dr. Eguia's presentation covered the results of the research collaboration between SEAFDEC/AQD with herself & scientist Dr. Evelyn Grace Ayson, University of the Philippines – Institute of Biology professor Dr. Zubaida Basiao & instructor Mr. Brian Santos and Tohoku University professor Dr. Akihiro Kijima & associate professor Dr. Minoru Ikeda. The study was funded by the Department of Science and Technology.

Apart from the oral and poster presentations, two workshops were conducted. Field trips were also made to a

mussel grow-out facility, which also cultured scallops and oysters; Stolt Sea Farm SA Facilities, one of the leading farms that produces the flatfish turbot in Europe and Santiago de Compostela historical sites. Dr. Eguia was very interested in listening to updates in aquaculture genetics. "One good thing learned from the presentations of various research genetic studies during the symposium was the fact that applications of current DNA technologies in commercial aquaculture were not only confined to population assessment studies which are known as prerequisites



Dr. Eguia beside her poster presentation

to selective breeding and ecological genetics but also to aquatic health management. Several selective breeding programs are now using genomic approaches in selecting specific pathogen-resistant stock considering that disease is a major concern in aquaculture industries," Dr. Eguia shared.

- JM DELA CRUZ / MRR EGUIA

# SEAFDEC/AQD provides training on shrimp good aquaculture practices

**S**EAFFDEC/AQD in collaboration with the Bureau of Fisheries and Aquatic Resources (BFAR) organized a *Training of trainers on ASEAN Shrimp Good Aquaculture Practices* for fisheries officers of Brunei, Indonesia, Malaysia and the Philippines East Asian Growth Area (BIMP-EAGA) from 25 May to 5 June 2015 at AQD's main station in Tigbauan, Iloilo.

The course which was funded by BFAR, focused on four modules namely (1) food safety and quality, (2) animal health and welfare, (3) environmental integrity, and (4) socioeconomic aspects. It covered lectures on the concept of sustainable aquaculture; management of shrimp broodstock, hatchery & grow-out; site selection; feeds & feeding; physical, biological, & chemical hazards; microbial contamination & sanitation; and responsible

use of chemicals, antibacterial agents & the withdrawal period of these chemicals. The trainees also visited shrimp ponds and hatcheries in Iloilo, Aklan and Negros Occidental.

The 22 participants who completed the course are from Brunei Darussalam (2), Indonesia (6), Malaysia (1), and the Philippines (13 BFAR technical staff). The activity aimed to strengthen the capacity of shrimp farmers of BIMP-EAGA. The ASEAN Shrimp GAP was developed in support of greater ASEAN harmonization of the aquaculture production sector, shrimp farming in particular, within the ASEAN region.

"I learned a lot of things from this course," said Mr. Tiburcio Donaie, of BFAR Region 7 and class chairman. He also expressed his gratitude to AQD for the full support to the program. 🐾

- RF BOMBEO



The trainees interview the owner of hatchery in Makato, Aklan

PHOTOS BY CV GENZOLA



The trainees during their workshop on the output of the shrimp pond and hatcheries they visited



The participants visit shrimp pond in Negros Occidental

## New learners finish sandfish course

**A** fifteen-day course on *Sandfish hatchery, nursery operations and management* was held 21 April-5 May 2015 at SEAFDEC/AQD's Tigbauan Main Station in Iloilo. There were seven trainees coming from Malaysia (2), Maldives (2), United States of America (1) and the Philippines (2).

This course was meant to provide the participants with technical knowledge and skills on spawning and larval

rearing, nursery and grow-out management of sandfish. There were lectures and practical sessions on broodstock management and spawning techniques; production of natural food organisms for sandfish larvae; and larval and nursery rearing techniques; grow-out management and processing of sandfish; among others. The trainees also visited SEAFDEC/AQD's stations in Dumangas, Iloilo and Igang, Guimaras. 🐾

- GK FAIGANI



Trainees listen to technical assistant Ms. Roselyn Noran (in green) for instruction during their practicals on sea ranching site assessment

PHOTO BY R PAGADOR

## Mud crab course concludes with 14 graduates

**P**articipants from Indonesia (1), Singapore (2) and the Philippines (11) completed the 23-day training course, *Mud Crab Hatchery, Nursery & Grow-out Operations*, on 17 June 2015 held at SEAFDEC/AQD's main station in Tigbauan, Iloilo.

The course had both lecture and practical

sessions on biology and identification of mud crab species, broodstock management and larval rearing, culture of natural food, health management, aquasilviculture, crab fattening and soft-shell crab farming, among others.

The trainees also visited some mud crab ponds and talked to mud crab traders in Pontevedra, Capiz.

- RH LEDESMA



PHOTO BY CV GENZOLA

A practical session on eyestalk ablation of mud crab

## SEAFDEC/AQD trains eight participants on prawn culture

**S**EAFFDEC/AQD's Binangonan Freshwater Station conducted a Special Training Course on Freshwater Prawn Hatchery and Grow-out Operations from 11 to 15 May 2015. The course aimed to provide the basic knowledge and skills in hatchery and grow-out of giant freshwater prawn to eight participants coming from different fields and

professions. The course included a wide array of topics on: site selection and water quality management, broodstock management, hatchery and nursery operations, natural food production, design and construction of pens, cages and ponds, grow-out in cages and ponds, health and disease management, nutrition and feeding, and aquaculture economics.

- F AYA



PHOTO BY MH STINSON

Engr. Emiliano Aralar supervises the trainees in performing physico-chemical parameter determination in land-based tanks



*Congratulations to the graduates of 2015!!!*



**Erish Estante**, research assistant, finished MS Fisheries-Aquaculture at the University of the Philippines Visayas

**Annie Franco**, senior technical assistant, finished MS Biology at the University of the Philippines Visayas

**Mary Anne Mandario**, research assistant, finished MS Fisheries-Fisheries Biology at the University of the Philippines Visayas

**Hananiah Sollesta**, technical assistant, finished MS Fisheries-Aquaculture at the University of the Philippines Visayas

**Yasmin Tirol**, former research assistant at AQD, finished PhD Fisheries-Aquaculture at the University of the Philippines Visayas



PHOTO COURTESY OF E ESTANTE

(L-R) Ms. Erish Estante, Ms. Hananiah Sollesta, Ms. Mary Anne Mandario, and Ms. Annie Franco

# SEAFDEC/AQD library Bangkok takeover

**A**QD senior information assistant Mr. Stephen Alayon attended two seminars in Bangkok – a leadership workshop & librarian conference – from 8 until 13 June 2015. Mr. Alayon, one of the 20 selected participants from 10 ASEAN countries, participated in the International Federation of Library Associations and Institutions’ (IFLA) Building Strong Library Association Workshop: *Leadership Workshop for young promising librarians to build stronger library association in ASEAN countries*. It was a two-day workshop that aimed to: (1) strengthen cooperation among libraries and information centers in Southeast Asian countries; (2) improve ASEAN resource sharing; and (3) introduce new library technologies, trends and innovations. It was organized by the Brunei Darussalam Library Association, Thai Library Association and the

IFLA regional office for Asia and Oceania. He also attended the *16th Congress of Southeast Asian Librarians (CONSAL XVI)* where he presented a paper titled, *For the record: the fate of libraries and records offices in the Visayas, Philippines devastated by the Typhoon Haiyan*. The paper described the extent of damages of selected academic libraries and government offices in Eastern and Western Visayas months after the disaster. It also identified the recovery, restoration and conservation initiatives done by librarians, archivists, records officers, office managers and volunteers. Mr. Alayon and his co-authors recommended the training of librarians, staff and other stakeholders responsible for the management of institutional records and applying a disaster management plan to minimize the risks in the future. 🐾

- JM DELA CRUZ



AQD librarian and senior information assistant Mr. Stephen Alayon (second from right) after his presentation at CONSAL XVI



Salvaging documents at a library in Tacloban, which is one of the libraries affected by Typhoon Haiyan

PHOTO COURTESY OF PLIA

## RESEARCH SEMINARS



Mr. Ernest Chiam, SEAFDEC/AQD’s trainee on its sandfish training course, discussed to fellow trainees, SEAFDEC/AQD research staff and on-the-job trainees (from various fisheries schools in the Philippines) the concept and benefits of aquaponics on 4 May 2015 at AQD’s Tigbauan Main Station. Aquaponics, as described by Mr. Chiam, is the combination of aquaculture and hydroponics. It is a semi-closed system, where water flows between a fish tank and a plant growing bed. In this system, the fish waste in the water is used to supply nutrients to the plants. In return, the plants and the microorganisms absorb and degrade the harmful fish metabolites thereby cleaning the water that then goes back to the fish tank. Hence, according to Mr. Chiam, this provides a mutual beneficial environment for both the fish and the plants, and results in two crops (the fish and the plants).

Another advantage that Mr. Chiam pointed out is that the aquaponics system can be done in a small-scale or backyard set-up occupying an area of only about 16 square meters. He mentioned that a family can grow their own fish and vegetables in their backyard using this system. Suitable fishes cultured in an aquaponics system are catfish, tilapia and sea bass. On the other hand, vegetables produced in an aquaponics system include kang kong (water spinach or swamp cabbage), pechay, tomatoes and chili.

Mr. Chiam is a senior sustainable aquaculture officer at the World Wide Fund for Nature in Melaka, Malaysia and has been working with the institution for about eight years. 🐾

- RH LEDESMA



In the midst of emerging diseases affecting the shrimp industry, AQD scientist Dr. Eleanor Tendencia presented her study *Pond management scheme to mitigate the effect of diseases on cultured *Penaeus monodon** in a research seminar on 19 May at AQD's Tigbauan Main Station.

Dr. Tendencia aims to develop pond management strategies to prevent and control shrimp diseases in an extensive culture system. According to the presentation, the best way to avoid any disease outbreak is to (1) make the shrimp tolerant to pathogens, (2) minimize stress by eliminating risk factors and (3) proper farm management practices.

In designing a management scheme for ponds, the methodology includes cross sectional study, literature search and small pond experiments. A list of important farming practices for good harvest and sustainable environment were gathered from cross sectional study includes: sludge removal, crack drying of pond, liming among others. These practices were then applied to the designed scheme (DS) to culture shrimp in ponds. The DS culture made use of the greenwater culture system with an abundant growth of planktons (supplemental feeding of corn was done in case of poor plankton growth), application of molasses and application of lime when water is turbid. Prior to release in earthen ponds, the *P. monodon* were stocked in hapa nets.

As a result of the experiment, there's a higher survival rate in ponds using the DS with lower luminous bacterial count and better water quality. Dr. Tendencia suggests the use of the DS and the greenwater culture system. 🐙 - JM DELA CRUZ



Dr. Michele Nishiguchi of New Mexico State University shared the results of her research project on her talk *Speciation, cooperation and predation, oh my! Tales from a dumpling squid and its luminous beneficial bacteria* on 29 May 2015 held at AQD's Tigbauan Main Station.

According to Dr. Nishiguchi, the mutualistic association between sepiolid squids and their *Vibrio* symbionts is an experimentally tractable model to study the evolution of animal-bacterial associations through both wild-caught and experimentally evolved populations. Since *Vibrio* bacteria are environmentally transmitted to new hosts with every generation, it provides a unique opportunity to resolve how changing environmental conditions may affect bacterial infection, colonization, and persistence in different host species. *Vibrio* bacteria encounter potentially conflicting selective pressures, competing with one another to colonize the sepiolid light organ, but also vying for resources in the environment outside the squid. Both abiotic and biotic factors contribute to the fitness

of individual strains of *Vibrio* bacteria, but which of these factors are amenable to adaptation and eventually lead to a successful beneficial association has yet to be elucidated.

Dr. Nishiguchi mentioned that the future directions of the research project will be: (1) experimental evolution/ecological diversification, (2) ecotype comparisons using environmental, evolved, and symbiotic isolates-evolutionary drivers, (3) combined models of population networks of host-symbiont associations with GIS, environment, and phylogenomics-computational systems ecology/ecoinformatics, and (4) molecular mechanisms of specificity. 🐙



Ms. Rena Santizo, AQD's Senior technical assistant, talked about her study on *Dietary substitution of protein concentrate of *Ulva lactuca* for soybean meal in the black tiger shrimp *Penaeus monodon* juveniles* last 18 June at AQD's Tigbauan Main Station.

Ms. Santizo explained feed intakes was statistically similar in shrimp fed the control diet and diet containing 15% *Ulva* protein concentrate (UPC) replacement while the feed intake of shrimps fed diets containing 30% and 45% UPC were lower and were not significantly different from each other.

Moreover, she discussed that the specific growth rate (SGR) of shrimps fed the control diet was not significantly different from the values of those fed diets containing 15% and 30% UPC replacement. Those fed diets containing 45% UPC replacement exhibited significantly the lowest SGR. She noted that protein gained in shrimps [computed as  $PG(g) = (final - initial) / whole\ body\ protein$ ], were statistically similar between those fed the control diet and those fed diets with 15% and 30% UPC. She

likewise said that the protein efficiency ratio was unaffected by the dietary treatments.

The result of her experiment showed that *Ulva* protein concentrate could be a substitute for soybean meal in the diet of *Penaeus monodon* juveniles up to 30% without compromising the survival, growth and feed utilization efficiency of the shrimp despite lower feed intake. 🐙 - GK FAIGANI



# PALARO 2015

Encouraging FUN: Fellowship, Unity and Nurture through sports



**T**his year's two-day Palaro held at AQD Tigbauan Main Station (TMS) began on 21 May 2015. It kicked-off with a fun walk and 3K marathon from Tigbauan Plaza to TMS.

Palaro 2015 lives up to its theme of "encouraging fun" through a dance fitness program called Zumba, which

was an enjoyable workout for AQD employees.

More fun continues as Team Bulgan and Team Tilapia compete on the the following sports: basketball, chairball, volleyball, bowling, billiards, chess & darts, table tennis, and lawn tennis. There were also parlor games for everyone to enjoy.

In related event, AQD employees at the Binangonan Freshwater Station (BFS) and the Manila Office (MO) held their sportsfest on 26 May 2015 at the Bakasyunan Resort and Conference Center in Tanay, Rizal.

Team Bulgan and Team Tilapia of the BFS-MO sportsfest enjoyed the fun

games like "earth ball" and an obstacle course relay. The teams also battled for sports like basketball (men only), billiards, and table tennis.

In the end, TEAM BULGAN was declared the victor of Palaro 2015 for both sportsfest held in Tigbauan and in Tanay. 🐟



PHOTOS THIS PAGE BY JIM DE LA CRUZ / RH LEDESMA



(Clockwise) Both teams are all smiles during the funwalk, Team Bulgan wins the marathon for both men and women categories, and employees prepare for the games doing Zumba.



AQD Chief Dr. Felix Ayson lights the cauldron to officially open *Palaro 2015* (left). Teams Bulgan and Tilapia take the oath of sportsmanship led by Deputy Chief Dr. Takuro Shibuno (right)

## Two teams... one trophy... let the battle begin!!!



Clockwise: Team Tilapia shows its prowess in the games of basketball, chairball, darts, table tennis, and volleyball (men). Team Tilapia beats Team Bulgan in all of these games



From Top, L-R: Both teams are good in strategy. Chess games between the two teams resulted in a draw. Team Bulgan on the other hand, overpower Team Tilapia in the games of volleyball (women), bowling, billiards, and parlor games (beer drinking, pull me closer and dodge ball). Congratulations to Team Bulgan!!!

# Team Bulgan vs. Team Tilapia (Part 2)

@ Bakasyunan Resort and Conference Center



PHOTOS THIS PAGE COURTESY OF MN SAMORANOS

From Top, L-R: AOD employees at BFS and MO enjoy the games like earth ball, obstacle course relay, billiards, table tennis, basketball (men) and wall climbing



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